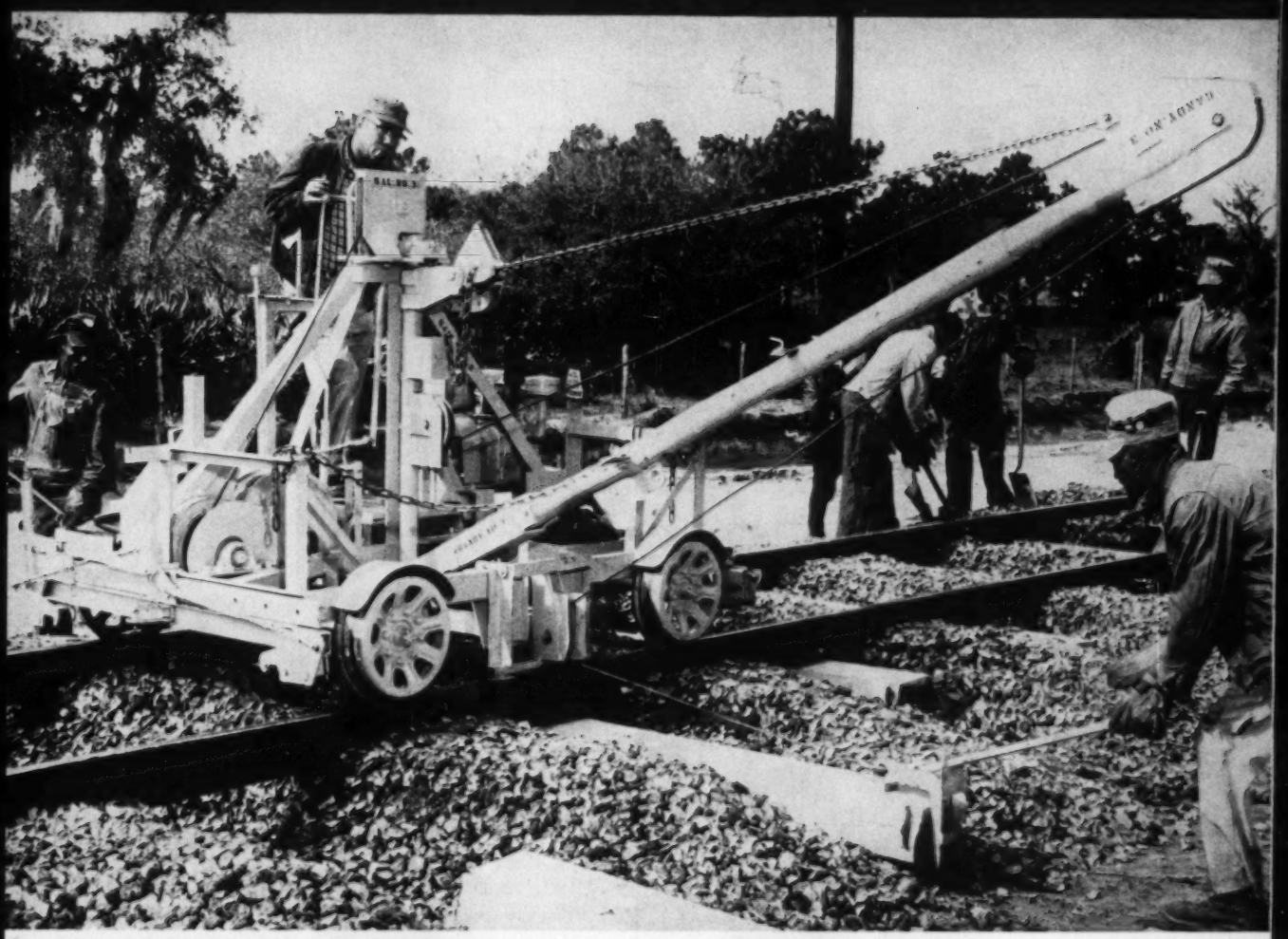
ENGINEERING NEWS-RECORD



Railroads take to prestressed ties p.32

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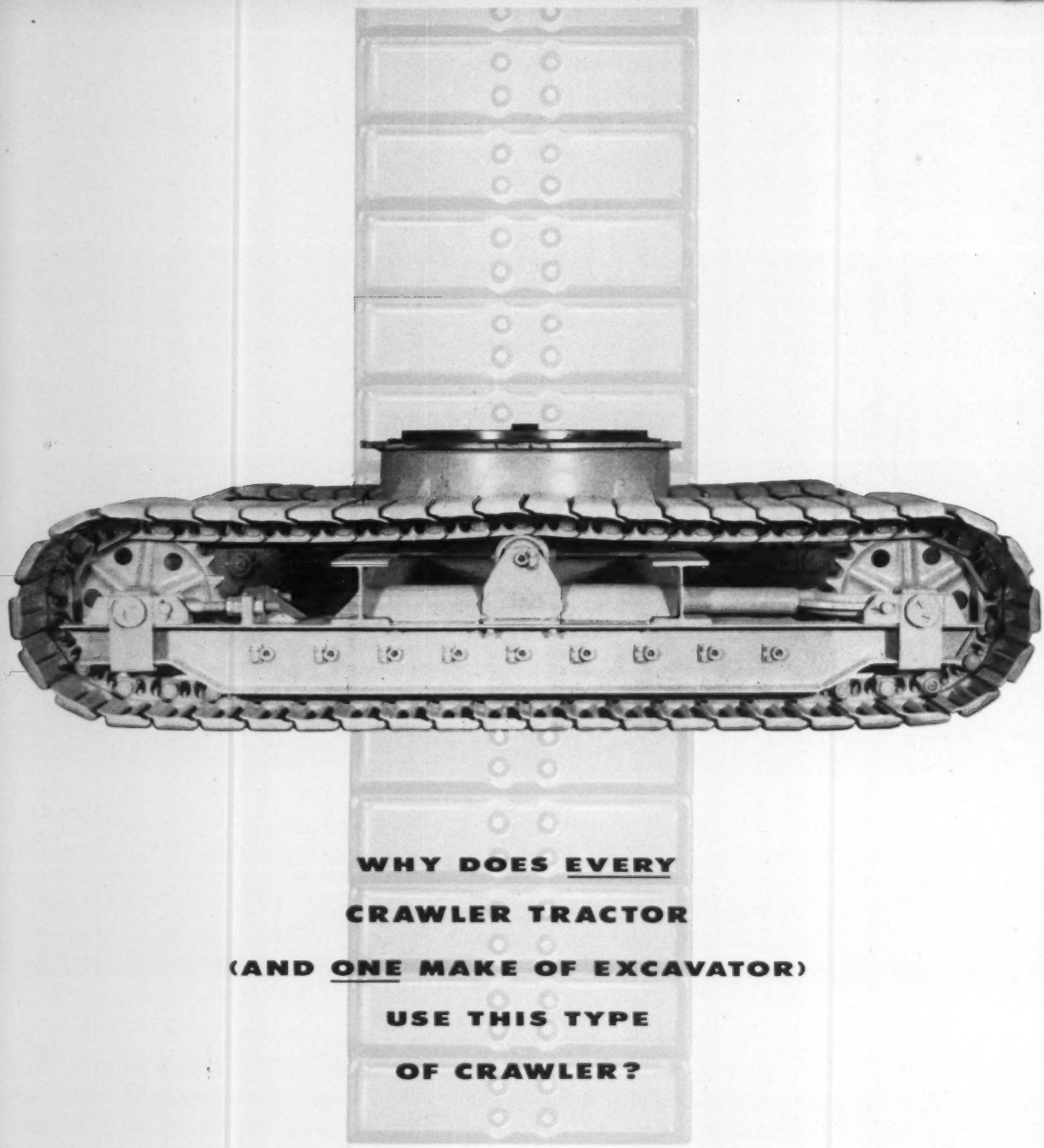

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You never will. Its superiority—both for maneuverability and easy maintenance—has been proved beyond dispute. And it's standard *only* on P&H excavators.

Equipped with tractor-type crawlers, an excavator wastes less of its power in fighting friction . . . has more power for propel. The unit rolls smoother and easier, moves with greater agility. What's more, there's substantially less wear on the crawler mechanism.

True, this type of crawler isn't exclusive with P&H. You can specify it on other makes at extra cost—for example, $3000 more on a conventional ¾-yd. machine. And it's *worth* the $3000. But why pay it?

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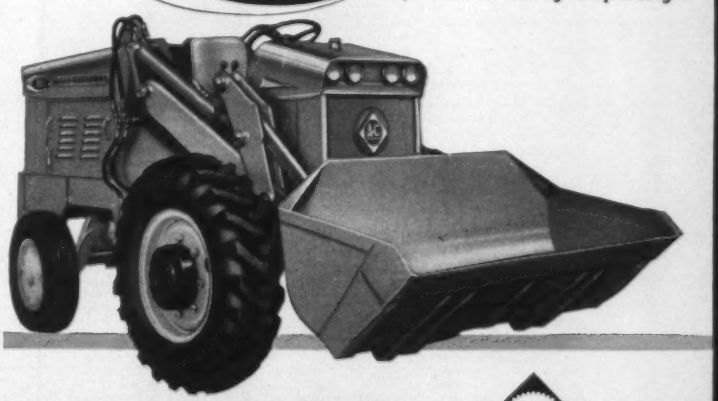
TL 10 2-wheel drive
3,600-lb carry capacity



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JOHN W.

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Project: Eufaula Dam, Canadian River near Muskogee, Oklahoma
Contractor: Joint venture of Tecon, Winston, Green
Dewatering Contractor: Subgrade Engineering Corporation

NOW WORKING THROUGHOUT THE SOUTHWEST. Power-Packers are working on big dirt jobs in New Mexico, Oklahoma, California and Texas. Here's why they lower compaction costs: More speed on the fill, no turn around time, no track maintenance, more horsepower per pound, easy electric steering and controls.

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PACEMAKER SCRAPERS. This is a 60-ton capacity Series L-60 Electric Digger self-loading in a deep sand borrow pit. Electric drive inside each wheel eliminates pusher equipment where these scrapers work. (Also units with 30 tons and 140 tons capacities.)

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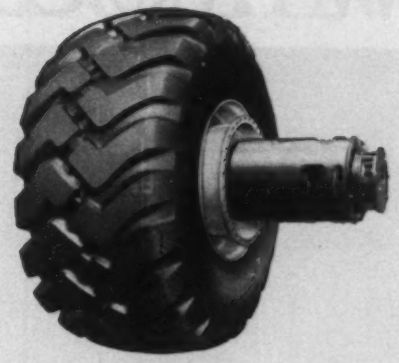

POWERFUL DC MOTOR AND GEAR REDUCTION in every wheel (or roller, in the case of Power-Packers) is the drive system for all PACEMAKER machines. Electric Wheel drive is simple — only an electric cable connects wheels to power source. Every component in this system is matched and balanced for performance in the system. All are designed and built by R. G. LeTourneau, Inc. expressly for the company's electrically powered and controlled equipment.

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This electric powered and controlled self-propelled sheepsfoot roller provides the ideal combination of mass and power for speedy, money-saving compacting.

You move no dead weight — every ounce goes into compacting. DC drive motors and gear reductions located inside each roller propel the machine. A single diesel-electric generating plant supplies the power.

Power-Packers have equal speed and power in either direction. Instead of turning the machine around, you merely spin a swivel seat and control console and you're away on another pass.

With 420 horsepower applied inside the rollers, these 40-ton machines work economically on the toughest fills. They operate on grades . . . climb in and out of core trenches and other "hard-to-get-to" places. Save at least a penny and a half per yard on compacting costs!

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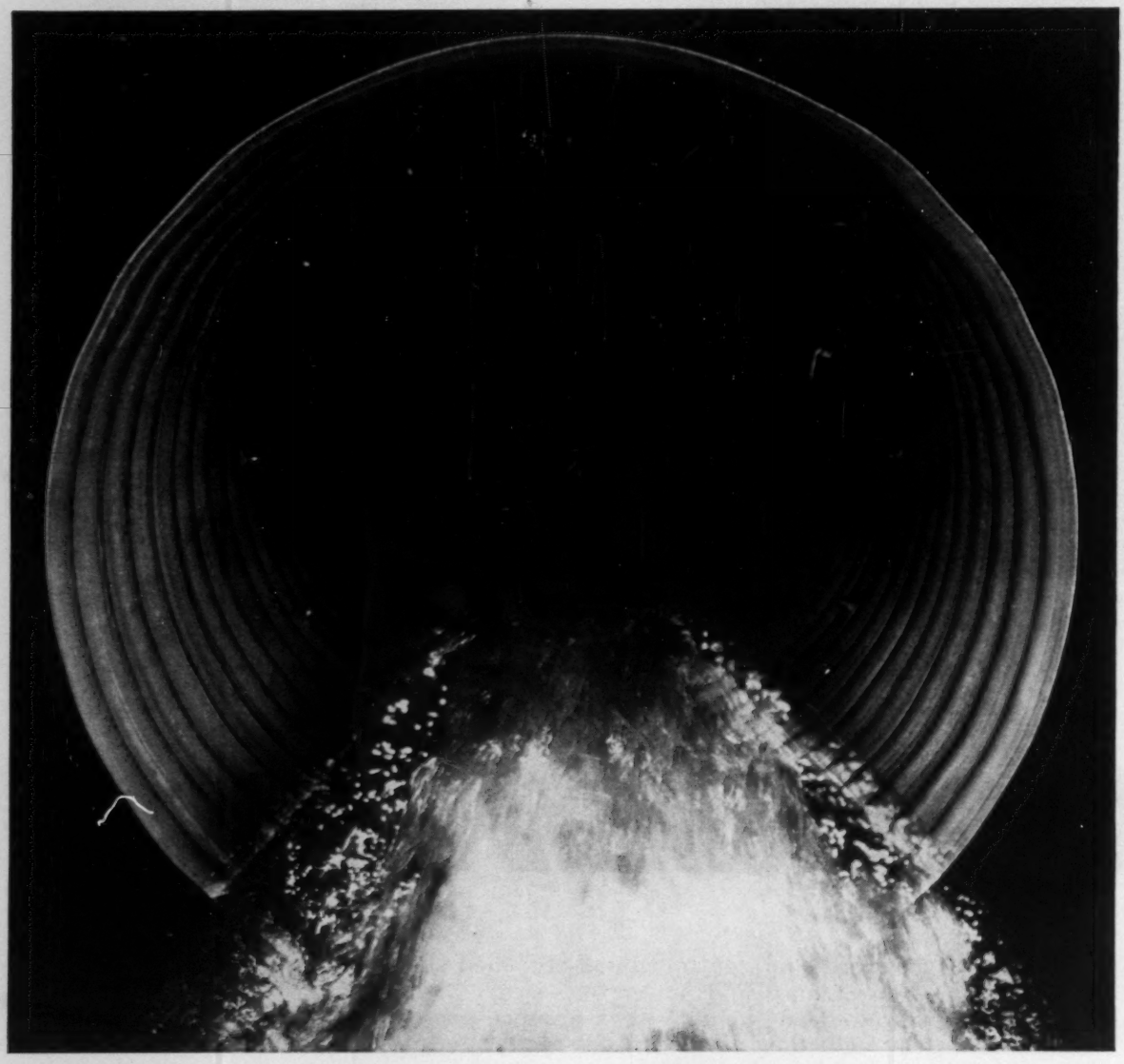

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The corrosion resistance of this new aluminum pipe is as thick as the metal itself. It is not endangered by everyday scrapes and runoff abrasion—conditions that chip off a galvanized coating and expose bare steel to rusting out. For any culvert load, fill limit, or safety factor you have normally specified for steel, there is now an aluminum pipe strength to meet your requirements. Independent tests show comparable installed pipe performance.

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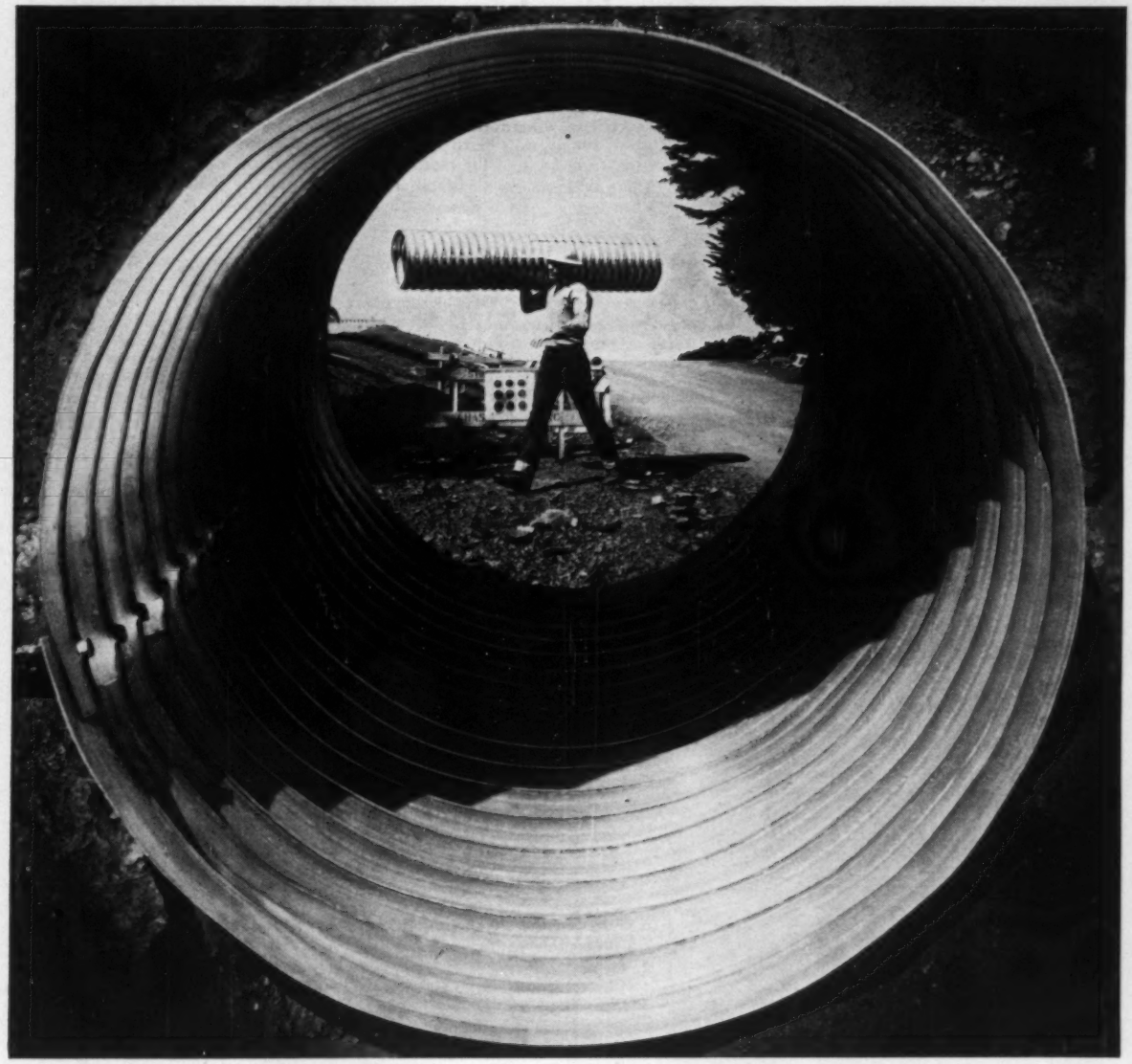

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Since early 1960, contractors have reported savings up to 20% in total job cost because of the lower handling and installation costs of aluminum culvert.

Aluminum pipe *weighs less than one-third* as much as steel—160 pounds against 500 pounds in a typical 20′ x 24″ section.

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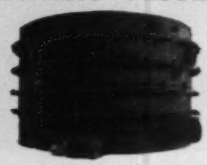

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Reader Comment

On Engineering Corporations...

SIR—In your editorial "Incorporation: Chronic Problem" (ENR Mar. 2, p. 72), you make this statement: "If incorporation is now permitted, the intent of the bills usually will be to liberalize the rules." The facts of the matter are exactly the opposite, as new legislation enacted in recent years indicates.

In the states of Missouri and Washington, the latest to enact new legislation pertaining to corporate practice of engineering, the rules have been tightened up with the approval and support of engineering corporations. In these states corporations wishing to practice engineering must apply for a certificate of authority, and provide information acceptable to the Board of Examiners before such a certificate is granted. The certificate must be renewed annually and an approval fee paid.

This is a great deal more restrictive than the vast majority of states, which permit corporations to practice engineering provided the engineer or engineers in responsible charge are licensed in the state. Under this type of legislation, the Board of Examiners has no knowledge of what is going on as far as engineering practice is concerned, and only when complaints are made does the board investigate to see that the law has been complied with.

Your editorial is consistent with the great amount of misunderstanding that exists throughout the country as to the desires of reputable engineering corporations and the laws under which they wish to practice. It is their sincere desire that these laws carefully protect the public, and carefully spell out the rights of the corporations so that the corporations and partnerships may know exactly where they stand.

Reputable engineering corporations will and do comply with sound, reasonable laws, urge their enforcement so that the public may be protected against the activities of incompetent, unreliable and unprofessional organizations.

Administering a corporation of any kind these days requires extended knowledge of the many rules and regulations surrounding its operation, and engineering corporations are much happier when they operate in any state which has a clearly understandable law which adequately protects the public.

The laws of Missouri and Washington have been drawn to recognize an accomplished fact, which certain groups of engineers have failed to face in their endeavor to prostitute the law, and make the law a favorable economic factor for their profession. For over fifty years industry has demanded and received their engineering professional services through the corporate form, which industry desires because of its many advantages and the additional protection which industry receives from contracts made with corporations. Because of this, many fine reputable engineering corporations have been established—some of them publicly owned and thus unable to change their status and comply with the selfishly drawn proposals of individual engineers who are trying to drive out competition.

F. E. LYFORD
Executive Director
Committee on Engineering Laws
New York, N. Y.

SIR—The editorial entitled "Incorporation: Chronic Problem" states that among the restrictions to such practice now favored by the principal interested societies is a requirement that the majority of the officers and directors be registered engineers.

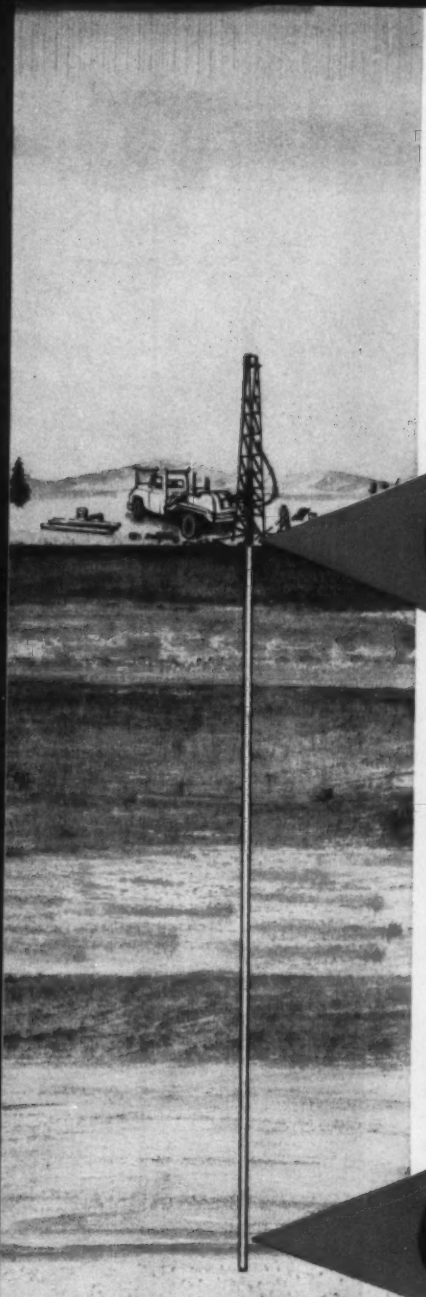
Your magazine printed news of the action of the National Council of State Boards of Engineering Examiners at its August, 1960 convention in Portland, Ore., when it adopted the so-called Model Law. This action has already been endorsed by several of the national engineering societies, and will certainly be endorsed by all of the founder societies except for the ASCE, which, alone among the founder societies, advocates any discrimination as to the form of business organization under which engineering is practiced.

The Model Law contains no such restriction as you state. Furthermore, while the Committee on Registration of the ASCE has promulgated such a policy, a poll of the membership, particularly among the thousands of civil engineers engaged in the construction industry, would certainly not support a position which would eliminate from practice such firms as Stone and Webster, Ford, Bacon and Davis, Bechtel, and the many other highly reputable engineering corporations.

There can be no disagreement with the statement in your editorial that engineers have a responsibility to be informed on this matter. However, their information is dependent upon the accuracy of its source.

G. J. CAVANAGH
Construction Engineer
Lumber and Plywood Division
Weyerhaeuser Co.
Tacoma, Wash.

Editor's Note: It is, as Mr. Cavanagh states, the ASCE, among the founder societies, whose policy still favors the requirement that a majority of the officers and directors of engineering corporations be registered engineers. The editorial did not state that this was a requirement of the Model Law. Other "principal interested societies" which have subscribed to the same view as ASCE, however, are the Consulting Engineers Council and the American Institute of Consulting Engineers.



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Layne Vertical Turbine Pumps are designed, engineered and manufactured by Layne in Memphis, Tennessee and nowhere else. Because pumping needs vary, there is a Layne pump for every pumping requirement—from 30 to 100,000 G.P.M. in sizes from 4 to 42 inches. Layne Pumps include Deep Well and Short Coupled (oil or water lubricated), Propeller, Mixed Flow, Regular and "In-Line" Submersible. For additional information write for bulletins 200-oil lubricated or 201-water lubricated.

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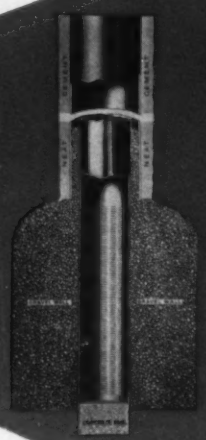
Water



The Layne Gravel Wall Well is an example of Layne experience, engineering and research. This gravel packing and 134 shutter screen employment affords larger screen openings, reduced friction, reduced draw down and pumping head. It increases specific capacity and makes for more effective retention of native sands. For additional information write for bulletin 900.

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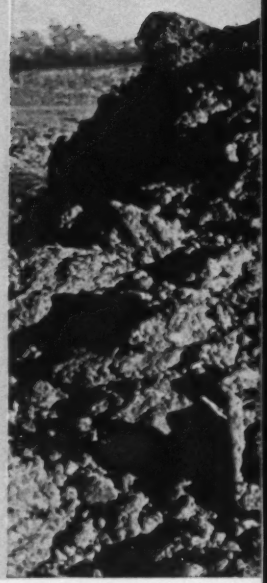
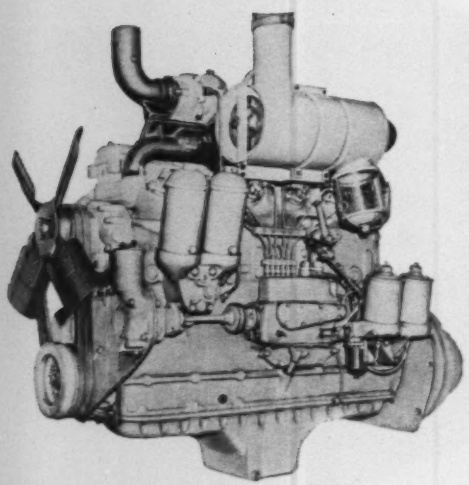
NEW International® TD-

...built to "BEEF UP" your profit edge!

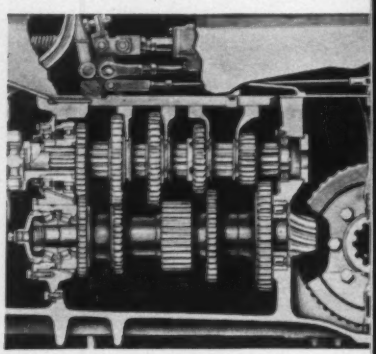


From air intake to new fixed drawbar—from day-to-day dependability through year-in, year-out durability—new strength, new performance protection, new work capacity are built into the new TD-20. Check and compare the advantages of International turbocharged Diesel power, teamed with beefed-to-match new transmission and final drive components—platformed on a far stronger-than-ever undercarriage—turned into new efficiency by International-built tracks, kept in life-prolonging alignment by exclusive International 3-point suspension. See your International Construction Equipment Distributor for a new TD-20 demonstration.



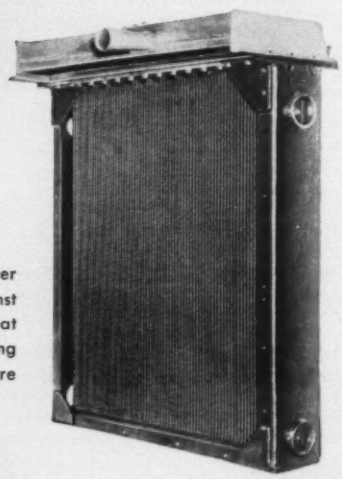
New Turbocharged Diesel Wallop

Modern turbocharging crams air into the new TD-20's smooth running 6-cylinder engine—to produce extra hp efficiently at all altitudes; and to give a 50% torque rise to lug larger overloads. Crankcase ribs are "beefed up;" cooling, air cleaning, and crankshaft capacity all are increased to team with turbocharging. Push-button TD-20 starting is by famous International gasoline-conversion system!



New transmission capacity ...New filtering system added

Heavier shafts, more rugged gears, and roller bearings of greater capacity are provided—to carry increased hp and add thousands of hours to working life of power train components. New transmission oil pump circulates and filters life-guarding lubricant. New "short-travel" levers add operating ease.

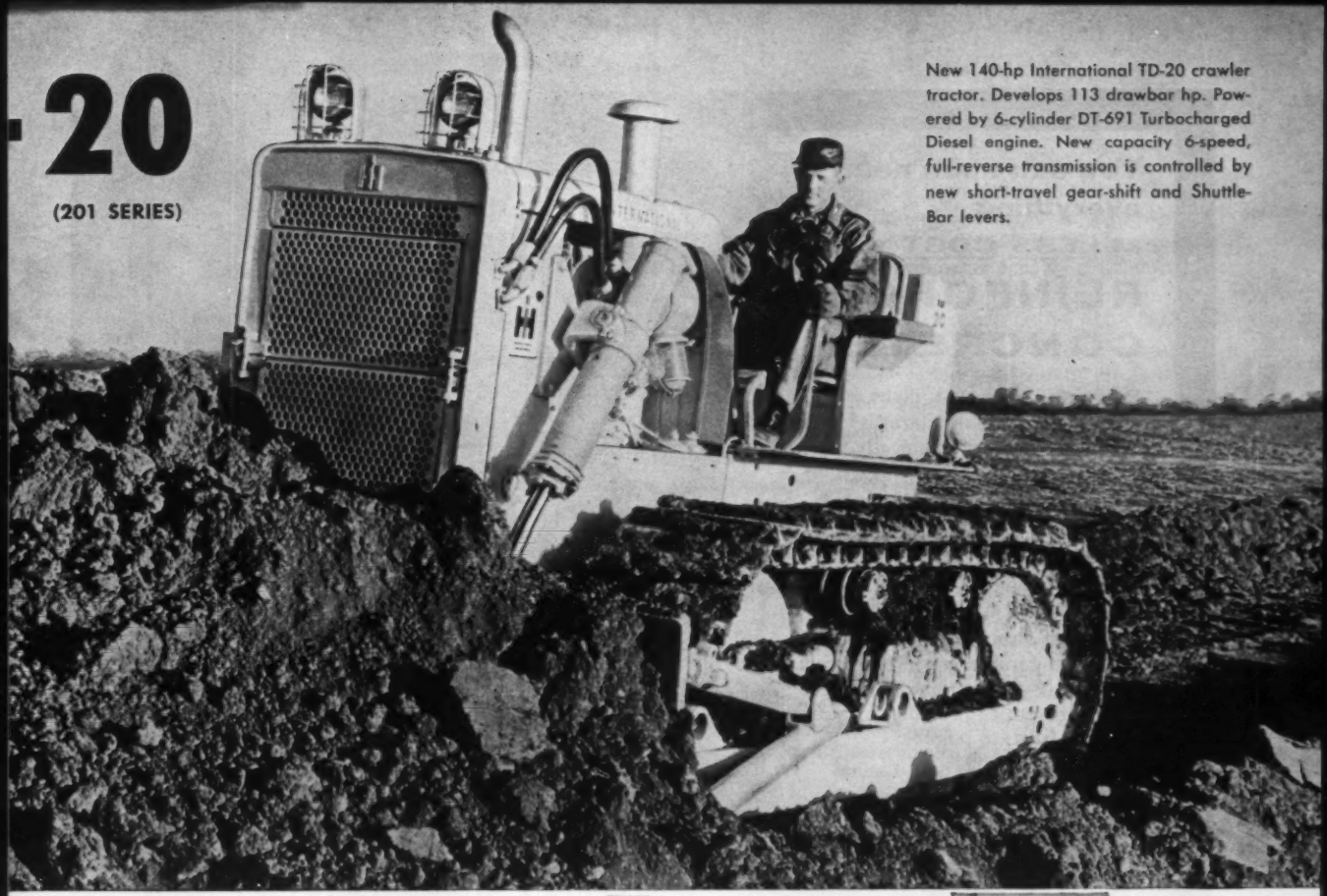


Larger radiator plus jet head increases cooling capacity

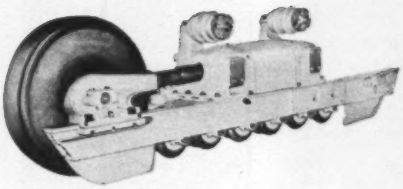
Coolant, under pressure from the new greater capacity radiator, is shot through jets against lower surface of TD-20 heads—to aid heat transfer and avoid build-up of heat-trapping deposits. Fan shroud and radiator guard are "heavied" for increased rigidity.

-20

(201 SERIES)

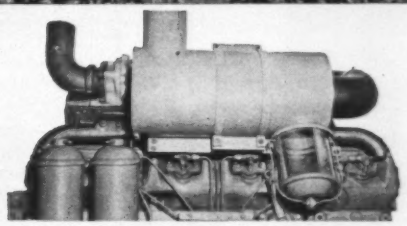


New 140-hp International TD-20 crawler tractor. Develops 113 drawbar hp. Powered by 6-cylinder DT-691 Turbocharged Diesel engine. New capacity 6-speed, full-reverse transmission is controlled by new short-travel gear-shift and Shuttle-Bar levers.



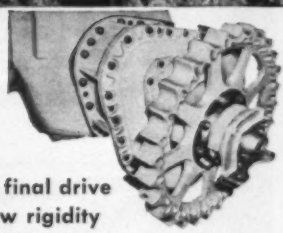
New Undercarriage Strength and Protection

New drum-type front idlers add strength... International also adds track chain guides to both sides of the TD-20's precision-welded double box-beam track frames! New track roller shields are of cast steel. New heavier strutless track links are self-cleaning and power-saving. The new hydraulic track adjuster, with built-in safety relief is "standard" on the new TD-20. And full-floating seals of increased efficiency guard Dura-Roller life!



New 99.8% efficient Dry-Type air cleaner

For positive "breathing" safety, the full air volume taken in by turbocharging is "dry-cleaned" of 99.8% of its dirt—by the TD-20 Diesel's new dry-type air cleaner. Handy, under-hood horizontal mounting—and transparent, quick-dump collector—greatly simplify servicing. Dash indicator shows "red" when cleaner element needs washing.



New final drive ...new rigidity

New TD-20 final drives have been strengthened to deliver full torque turbocharged power to the tracks. New sprocket drive doweling increases housing rigidity—helps maintain precision component alignment. Other major steps ahead in TD-20 design include: new torque-taking, life-adding bimetallic steering clutch discs; new pivot shaft inner spacer; new hardness of sprocket drive pinion shaft.

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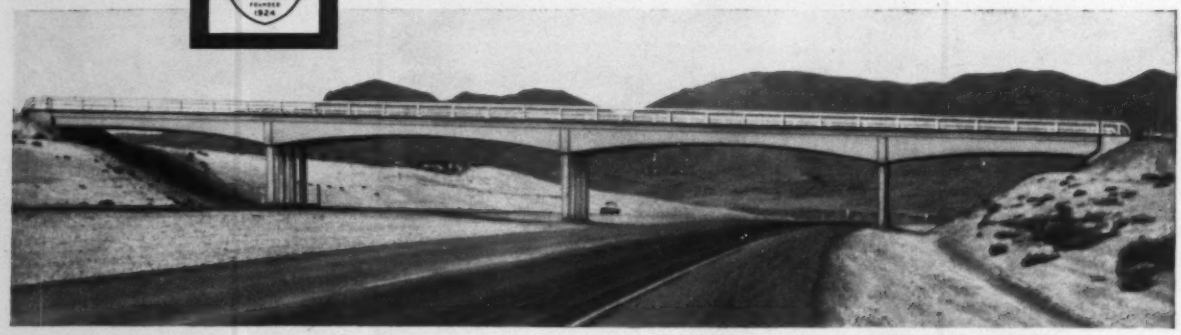
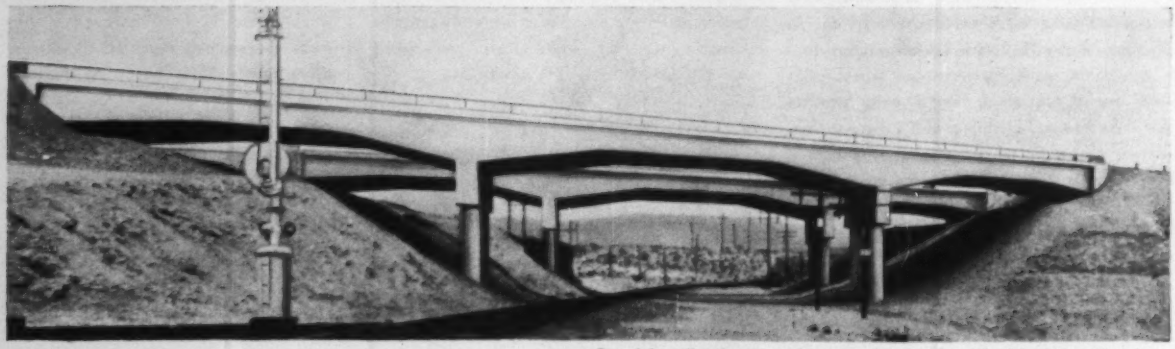
Arch bridge over north fork of Payette River, State Highway 15, Smiths Ferry, Idaho
Designers: Idaho Department of Highways, Boise, Idaho
Contractor: C. F. Dinsmore



"T" girder highway overpass, Interstate Highway 80, Low, Utah
Designers & Engineers: Ken R. White Consulting Engineers, Denver, Colorado
Contractor: M. Morrin & Son Co., Ogden, Utah



Box girder railroad overpass, Interstate Highway 15, south of Las Vegas, Nevada
Designers: State of Nevada Department of Highways, Carson City, Nevada
Contractors: Whiting Bros. Construction Co., Industrial Construction Co., and General Contractors

14-6

ENGINEERING NEWS-RECORD

Vol. 166, No. 14 April 6, 1961

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THE CONSTRUCTION WEEK

BACK IN THE FOLD—Layman & Sons, Tulsa highway contractors indicated by a grand jury on a charge of fraud in construction of an Interstate highway bypass last year (ENR Apr. 7, 1960, p. 24), have been reinstated "without prejudice or penalty" to the Oklahoma Highway Department's approved bidders.

TOWER REPORT READY—Air Force investigators have completed their report on the offshore radar tower that crumpled under unexpectedly high winds and waves last January (ENR Feb. 2, p. 22). But advance word is that it doesn't contain much in the way of design or construction information that would explain the failure. The Air Force, meanwhile, is considering further study of the design criteria used.

ST. LOUIS GETS THE BILL—St. Louis citizens learned last week that they will have to spend $95 million to $105 million on sewage collection and treatment works by 1967 to meet the Public Health Service's demands for cleaning up the Mississippi. The estimate was based on a two-year study by Horner & Shifrin, St. Louis consulting firm.

STRIKE TWO—For the second time in six months, California has failed to obtain the financing required to start construction of the San Pedro-Terminal Island suspension bridge over Los Angeles Harbor. Because the sole bidder was also advisor to the state on the bond issue, the attorney general recommended rejecting the bid. Last September, the bond offering failed to draw any bidders. New bids for the bonds will be received April 11.

TAX BITES BACK—Texas' legislature is considering a proposal to place a 5% tax on highway contractors' receipts to help raise $150 million in new revenue. If passed, chances are good the state will find highway bid prices 5% higher on the average.

PAVING WITH PUBLICITY—Eighty-six public relations men from highway agencies and organizations around the country spent three days picking each others brains in Washington last week. American Association of State Highway Officials and Better Highways Information Foundation sponsored the session. Among favored publicity techniques: press tours of highway hearings, and special films for service clubs and civic groups.

PICKLED HERRING—Scotland's River Bladnock last week became the most happily polluted stream in the world when a distillery workman turned the wrong tap and let 5,000 fifths of fine Scotch whiskey drain into the river. That means 153,000 standard nips of booze will eventually reach the herring waiting in the North Atlantic.

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WASHINGTON OBSERVER

- **Leaks in the Highway Trust Fund?**
- **$100 million asked for pollution control**
- **More for small business**

- **Congressmen are concerned over new drains from the Highway Trust Fund proposed by President Kennedy.** One would provide federal aid to help relocate persons displaced by road construction. Another would charge against the Trust Fund instead of the Treasury the cost of roads through federal forests and public lands. The latter has been rejected once by the Senate, isn't given much of a chance now.

  Mr. Kennedy asks that those displaced by new highways be helped to find comparable homes convenient to work and shopping centers. Members of the Senate and House public works subcommittees want to know whether such aid should go only to renters or also to owners, who already have been reimbursed, and whether it would include moving costs. If the cost runs too high, this request, too, probably will be rejected.

—

- **A $100-million-a-year water pollution control program is the goal of Secretary Abraham A. Ribicoff of Health, Education and Welfare.** He told the House Public Works Committee last week there is a current need for more than 5,000 municipal waste treatment plants, and the present $50-million-a-year federal grant program is insufficient to meet this need.

  Secretary Ribicoff's proposal represents a slight downgrading of federal aid being considered by the committee. This is a bill by Rep. John A. Blatnik (D., Minn.) to increase construction grants to $125 million a year for 10 years. There is considerable sentiment in Congress favoring a boost and something close to Mr. Ribicoff's $100 million may be approved.

—

- **Contract set-asides for small business are rising as a result of President Kennedy's order to step up such awards by 10% over fiscal 1960.** An order putting the Interior Department in line with the President's directive is awaiting only the signature of Secretary Stewart Udall. It is similar to one adopted by the Defense Department last fall.

  The Udall order will set aside Reclamation Bureau construction contracts of up to $500,000 for small firms. A $300,000 limit will be placed on small business set-asides by Interior agencies, which do less construction.

  But Corps of Engineer jobs will be set aside in bigger chunks. Army Secretary Elvis J. Stahr, Jr., wants the Corps to increase its set-aside awards by 20% to enable the Army to meet its over-all increase of 10%. Two $4-million Corps contracts will be advertised soon for small contractors.

—

- **The shape of airports 10 years hence will be studied by a special task force named by President Kennedy.** Chief task of the group is to determine the investment necessary over the next decade in both airports and aircraft. In determining this, it will discuss in detail the types of aircraft most likely to be in use and what these will call for in the way of airport design and location. Fred M. Class, executive vice president of the Empire State Building Corp. and former airline official and Director of Aviation for the New York Port Authority, is chairman.

ENGINEERS—A New Installation Concept in Floor Grating!

Simplifies Maintenance, Lowers Total Costs

Now a new installation technique completely eliminates the need to anchor floor grating in place. This allows erection as fast as the structural steel support members are placed and bolted. The technique is only possible with a special reversible Borden Type K panel which will lie perfectly flat on supporting steel with no tendency to rock.

Furthermore, floor grating can now be installed and used for working and walking as quickly as the main structural members are erected. Two men can lift any panel in a matter of seconds for easy accessibility and maintenance.

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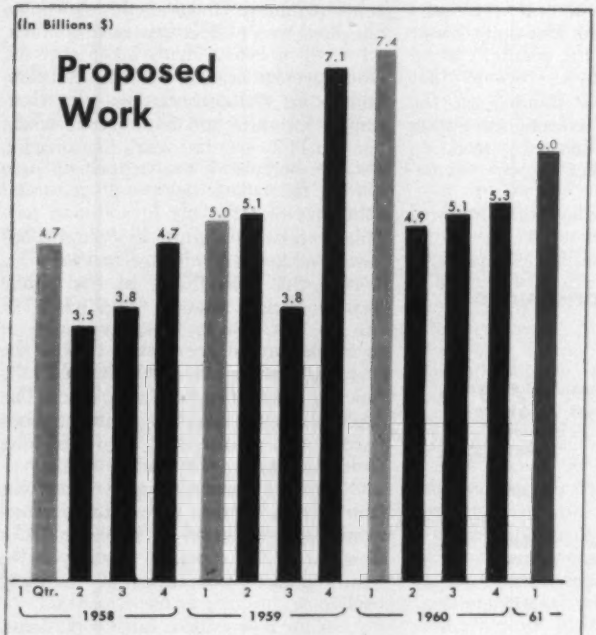
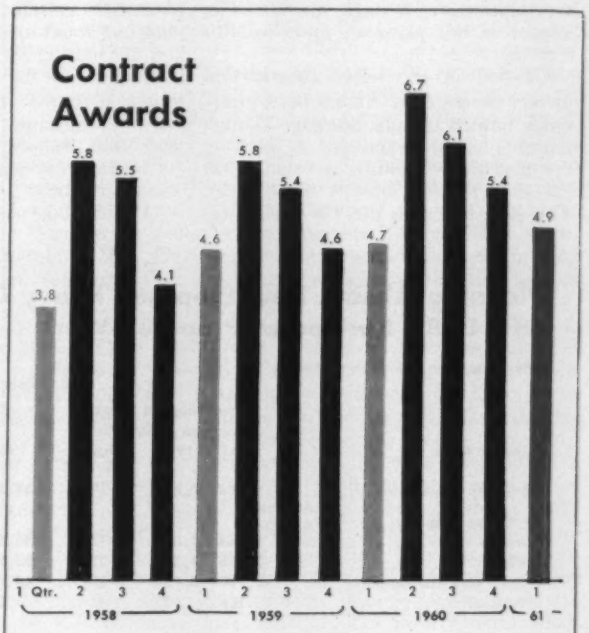


Engineers and architects scooped up design business that will eventually become $6 billion worth of construction. It was their third consecutive quarterly increase in new proposed work and the third biggest first quarter for their new business on record.



Contractors' new business, added to owner-builders' projects, make the first quarter the biggest since the all-time high, set in '56. The gain over last year is 6%. Largely responsible for the gain is public works; private works is temporarily wobbly.

First Quarter Pace Tops Forecast

New construction business is coming along at a faster pace than ENR forecast for the year. Even more important for the longer pull, new plans are coming along at a faster pace for private construction, which was the expected weak sector of the 1961 heavy construction market.

By the end of the year, potential buyers may wax enthusiastic enough to lift this year's volume of work going on engineers' and architects' drawing boards to a new all-time high. Key to this surge is the huge volume of industrial plants and commercial buildings pouring into the planning stage.

Businessmen's construction planning is traditionally sensitive to business recessions, but all signs point to greater optimism than was apparent only a short time ago.

The increased planning for industrial and commercial buildings is all-important to the construction industry. This year was expected to be a year of moderately decreasing private heavy construction contracts (ENR Jan. 26, p. 44). But what may develop instead, if the current increased rate of new plans is maintained, is a pepped-up contract awards rate later in the year as more projects clear the planning stage.

March was actually the fourth month of a strong uptrend in new proposed industrial buildings. The estimated construction costs of plants proposed last month soared to $602 million, or double the combined January-February volume. An upswing in proposed industrial building characteristically takes from six to nine months to bring its full force to bear on the contracting rate. So the current upswing—in its fourth month in March—probably won't show up on contractors' books until mid-year or later.

Meanwhile, industrial contracts have flowed in in larger volume than expected. ENR industrial awards climbed 42% above last year's first quarter.

The 1960-61 gain exaggerates the trend because the first quarter of 1960 was the lowest of the year, and low by any standard for recent years. However, there is a definite improvement over a year ago and over the immediately preceding quarter as well.

This strong start for industrial contractors will help offset sluggishness likely to set in during the current quarter as a reaction to the slackening of plans during September-November '60.

It adds up to this: Chances of a gain over 1960 industrial construction volume have improved greatly.

(Please turn the page)

New plans for commercial building topped $1 billion in total estimated construction cost during the first quarter. That's a hefty 26% jump over a year ago and the largest dollar volume ever proposed in a single quarter. The impact of this planning spurt will hit contractors in 1962.

Caution in the heavy construction market during early '61 has been pretty much limited to mass housing. Though monthly volume increased in each of the first three months, it totaled 3% less than the first quarter of last year. This is in line with the 4% decline for the year as a whole forecast by ENR last January. Some might expect the Administration's housing bill, introduced in Congress last week, to provide enough variety and amounts of federal financial assistance to tilt the mass housing trend upward. But don't count on it. Housing isn't the counter-cyclical influence on the U.S. economy that some observers have claimed on the basis of housing's performance during the 1950s. Indeed, the current recession is hurting the market for new owner-occupied houses.

Public works plans have been initiated in much lower volume to date in '61 than in the corresponding period of last year (see table). The 22% drop in state and local proposed work could reflect the recession's effect as a damper on civic planning. However, this slowdown in plans won't affect contracting much, if at all in 1961. That's because of the long average lead time between planning start and construction start. Contracts for state and local public works are up 11% over last year's first quarter, mainly because of the stepped up pace of the federal-aid highway program and the fact that the big increases in new plans initiated during 1959 and 1960 are reaching the bid stage in 1961.

On the federal side of the public works market, volume is up only 7% so far. But look for a bigger margin of gain in the balance of the year as the new Administration accelerates federally owned construction of many types. The Administration has pulled out just about every stop available to spur planning and contracting for public works.

Contract awards are up over last year for most key types of public construction: waterworks 15%; sewerage 20%; highways 27%; public housing 38%; and public nonresidential building 18%.

On the down side is earthwork, dams, waterways, which has dipped 4% in a decline that's almost sure to stop when the Corps of Engineers and the Bureau of Reclamation get going on those 56 new starts OK'd for fiscal 1962.

Bridge contract volume has stumbled 41%, largely a reflection of the heavy volume of awards for New York City's Narrows Bridge let in the 1960 period. A 10% drop in public "unclassified" construction awards traces to a smaller volume of missile base construction in the first quarter of '61 than a year ago.

Planning Ahead: New Proposed Heavy Construction Lifts ENR's Backlog of Proposed Work . . .

ENR—Reported in millions of dollars

Type of Work	New Proposed Work January–March 1961	1960	Chg. %	ENR Backlog of Proposed Heavy Construction As of March 1961	1960	Chg. %
All Heavy Construction	5,974	7,414	−19	125,330	122,359	+2
By Ownership						
Private	3,448	4,064	−15	56,340	54,250	+4
Public	2,526	3,350	−25	68,990	68,109	+1
State and Municipal	2,290	2,925	−22	54,736	53,697	+2
Federal	236	425	−44	14,254	14,412	−1
By Type of Work						
PUBLIC						
Waterworks	278	96	+190	3,055	2,880	+6
Sewerage	211	176	+20	4,188	3,880	+8
Bridges	117	89	+31	3,289	3,389	−3
Highways	358	1,173	−69	13,578	13,844	−2
Earthwork, dams, waterways	17	54	−69	12,039	12,002	+0.3
Buildings	1,372	1,393	−2	22,839	22,126	+3
Unclassified	173	369	−53	10,002	9,988	0
PRIVATE						
Commercial buildings	1,016	821	+24	27,978	26,140	+7
Mass Housing	948	2,160	−56			
Industrial buildings	1,192	906	+32	17,616	17,488	+1
Unclassified	292	177	+65	10,746	10,622	+1

. . . Going Ahead: Construction Contracts for March and the 1st Quarter

	March, 1961 New England	Middle Atlantic	South	Mid-West	Mississippi to Rockies	Far West	Total U.S.	% Change '60 to '61	Three Months — U.S. Cumulative 1961	1960	% Change '60 to '61	Canada Mar. 1961
Public Works, Total	44,864	121,276	205,939	123,788	279,301	154,165	928,353	− 5	2,417,091	2,192,904	+10	40,199
Waterworks	1,141	4,053	4,706	8,109	9,873	7,505	35,447	+ 4	87,464	76,123	+15	941
Sewerage	2,221	12,684	7,722	18,814	22,511	4,463	68,415	+35	163,592	136,841	+20	3,381
Bridges	135	7,522	9,779	11,639	10,666	3,197	42,938	−61	125,932	210,619	−41	5,254
Earthwork, waterways	972	1,247	16,861	11,107	43,507	9,173	82,867	+25	161,710	168,220	− 4	11,586
Streets and roads	19,495	21,127	65,637	47,440	77,813	46,615	278,127	− 2	818,028	642,968	+27	3,220
Buildings: Residential	7,093	6,772	20,461	4,330	15,372	14,614	68,642	+108	160,627	116,146	+38	1,648
Other	11,684	50,080	57,262	17,361	25,406	55,852	217,645	−15	601,570	510,379	+18	6,631
Unclassified	2,123	17,791	22,611	4,848	74,153	12,746	134,272	− 5	298,168	331,608	−10	7,538
State & Municipal	41,183	102,446	133,666	110,123	151,748	119,007	658,173	− 8	1,823,178	1,635,539	+11	24,681
Federal	3,681	18,830	71,373	13,585	127,553	35,158	270,180	+ 3	593,915	557,365	+ 7	15,518
Private, Total	40,957	333,310	148,859	99,644	207,300	153,832	983,922	− 4	2,515,374	2,475,786	+ 2	61,364
Bridges								−100		1,149	−100	
Buildings: Industrial	4,321	92,377	55,163	23,706	65,704	15,843	257,114	+70	795,005	558,868	+42	31,744
Mass housing	27,358	182,233	61,551	51,848	74,165	100,002	497,157	+12	1,096,459	1,128,842	− 3	17,680
Commercial	8,980	57,045	26,063	23,226	46,464	34,752	196,530	−11	514,139	502,304	+ 2	10,631
Unclassified	298	1,655	6,082	884	20,967	3,235	33,121	−84	109,771	284,623	−61	1,300
Total, Mar. 1961—5 wks.	85,821	454,586	353,898	223,372	486,601	307,997	1,912,275	− 4				101,563
Total, Feb. 1961—4 wks.	76,368	292,403	214,534	209,715	328,464	238,140	1,359,624	....			....	143,205
Total, Mar. 1960—5 wks.	130,996	453,416	244,712	312,400	503,388	356,475	2,001,387	....			....	342,948
Three Mos. 1961 (13 wks)	237,967	1,142,956	882,182	690,456	1,201,796	777,108	....	....	4,932,465	....	+ 6	356,825
Three Mos. 1960 (13 wks)	312,979	1,199,812	638,780	733,562	1,016,709	766,848	....	....	....	4,668,690	....	535,123
% Change '60 to '61	−24	−5	+38	−6	+18	+1	....	....	....	....	....	−33

ENGINEERING NEWS-RECORD *reports U. S. (50 states) construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.*

Defense Shakeup Cuts Corps Payroll

Corps of Engineers field offices were realigned and trimmed down last week in the over-all Department of Defense belt-tightening that closed or curtailed 73 military installations around the world. The shakedown leaves civil works field functions almost unchanged, but cuts in half the number of district offices responsible for military construction.

The Corps consolidated its military construction responsibilities in a smaller number of districts, but without closing any of the present 42 districts. The reshuffle will permit an estimated reduction of 1,700 district personnel out of 40,900 employed by the Corps.

Civil works responsibilities of the 42 offices remain as before except in the Washington (D. C.) District. This unit is down to the status of an area office under the Baltimore District. Baltimore also will assume the military construction function of the Norfolk District. The Washington area office will continue to handle District of Columbia water supply and Potomac River survey activities on its own, as before.

The Corps notes that the work load in the district offices had fallen off greatly since the shift of all missile base construction to the Corps' new Ballistic Missile Construction Office in Los Angeles last August.

Last week's order cuts to 17 the number of district offices performing military construction. At the beginning of 1960, 33 districts had military construction assignments.

The transfer of military construction responsibility will be stretched out over several months to take advantage of scheduled job completions and thus ease the impact on personnel.

Here are transfers of military construction missions: Washington to Baltimore; Wilmington, N. C., Charleston, S. C., and Savannah, Ga., to Jacksonville, Fla.; Pittsburgh, Pa. and Huntington, W. Va., to Louisville, Ky.; Nashville, Tenn. to Mobile, Ala.; St. Paul to Chicago; Tulsa, Galveston and Little Rock to Fort Worth and Albuquerque; Walla Walla to Seattle; San Francisco to Sacramento.

The size of the cut in any one district cannot be determined until after projects have been transferred.

Besides reassigning military construction responsibilities, the Corps is making civil works changes to reduce overhead expense of handling current nonmilitary work loads. In this readjustment, eight districts will reduce present staff requirements. These districts will receive administrative and engineering support from other offices.

Changes of this kind will be in district offices at Norfolk, Buffalo, St. Paul, Nashville, Charleston, Wilmington, and Galveston. District engineers of these districts will continue to have full contracting officer operational and other authority to act on civil works matters in the area covered by the district. These districts, however, will receive administrative and some engineering and technical support from other nearby Engineer districts. The organizational arrangement retains in each district a nucleus staff upon which to expand if it becomes advisable.

Another field office, the Eastern Ocean District in New York City—although engaged solely in military construction outside of the U.S. (principally in Iceland and Greenland)—will in the future receive substantial support from the New York District. That will result in some consolidation of administrative and technical staffs.

In the New England Division, consolidation of the Providence and Portland area office staffs with those of the headquarters office in Waltham, Mass., is planned. Field project offices then will get their administrative and technical support from the Waltham office.

For Depressed Areas: Construction Aid

The President is expected to get and sign by mid-April a $394-million area redevelopment bill designed to attract new industry to areas of substantial, chronic unemployment by supplying construction funds for factories and public works.

The bills passed by the Senate and House will mean loans and grants for 103 labor market areas (20 major urban areas and 83 smaller ones) plus a number of depressed rural areas.

Senate and House versions differ in only one major respect: The Senate bill authorizes "back door" financing through the Treasury without further review by Congress; the House bill requires annual appropriations by Congress. This will be settled perhaps next week in conference.

The depressed area program swept through 63 to 27 in the Senate, and 250 to 167 in the House. A GOP-Southern Democrat attempt to substitute a more modest bill excluding help to rural areas was soundly beaten.

Advocates of the program don't expect it to help "hard core" depressed areas, such as the coal towns of West Virginia. It is designed to help marginal and declining areas make a comeback. A requirement that some local and private capital must go into the program is to assure that the redevelopment plans are economically sound.

The program provides:

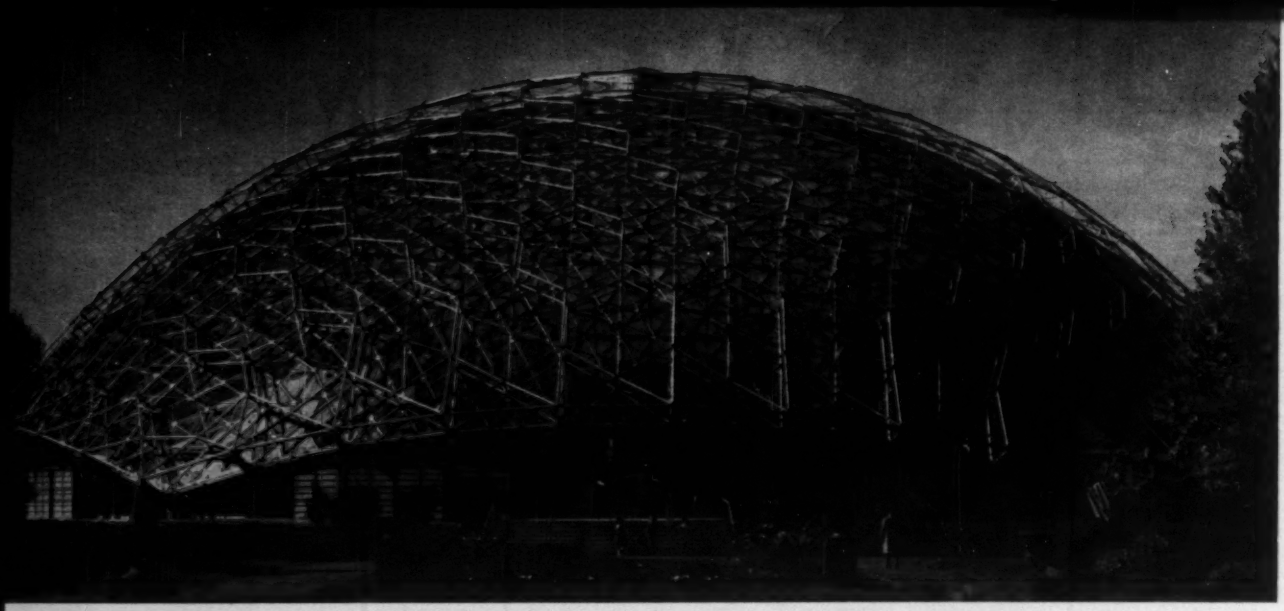
- A $100-million revolving loan fund for urban areas. This can be used for building new industrial plants, renovating existing ones, acquisition and development of land for industrial parks, and in some cases for purchase of machinery. Loans would be for 25 years (with 10-year extension possible) at 4⅛%. Federal support could run to 65% of the cost of a project, the rest coming from local and state governments and private sources.
- $100 million in similar loans for rural areas for the same purposes and to provide tourist facilities. Some 500 counties with high unemployment or "under-employment" (part-time farmers) can qualify. Most of this aid will go to southern states and West Virginia, Kentucky and Oklahoma.
- $100 million in loans for public facilities—water, sewers, etc.—necessary to attract industry. These would be 40-year loans (possible 10-year extension) at 3.5%. The federal loans can cover the entire cost.
- $75 million in public facility grants, for up to 65% of the cost of a project for communities that cannot afford the loans.
- $4.5 million for retraining workers and $10 million in subsistence payments for 16 weeks while taking training.
- $4.5 million to help communities draw up redevelopment plans.

Another feature of the program would allow depressed areas to get urban renewal funds ordinarily earmarked for housing and use them for renovating or creating industrial sites.

Of the total appropriations $300 million is in repayable loans that will go into a permanent revolving fund.

The area seeking aid must submit a plan for over-all economic development to the Secretary of Commerce for approval. This means there must be some kind of legal, local entity, usually a redevelopment commission or nonprofit corporation. The loans are then made to that organization, which in turn arranges with private companies for establishing or renovating plants.

Congressional experts believe the first loans could be made within a few weeks after an administrator is chosen.



Trussed Dome Brings Home the Bacon

A spherical dome, with a translucent plastic roofing suspended below its trussed aluminum framing, won the $25,000 annual R. S. Reynolds Award for architects Murphy & Markey of St. Louis. This is the first time in its five-year existence that the award has gone to an American firm.

The 175-ft-dia dome roofs the Climatron, a display greenhouse housing tropical plants under closely controlled atmospheric conditions.

Five equally spaced exterior columns support peripheral arch rings from which spring continuous hexagonal framing. This consists of aluminum compression tubes and tension rods connected by radial struts 30 in. long. Suspended 12 in. below the spherical surface generated by the tension rods are several thousand transparent plastic panels.

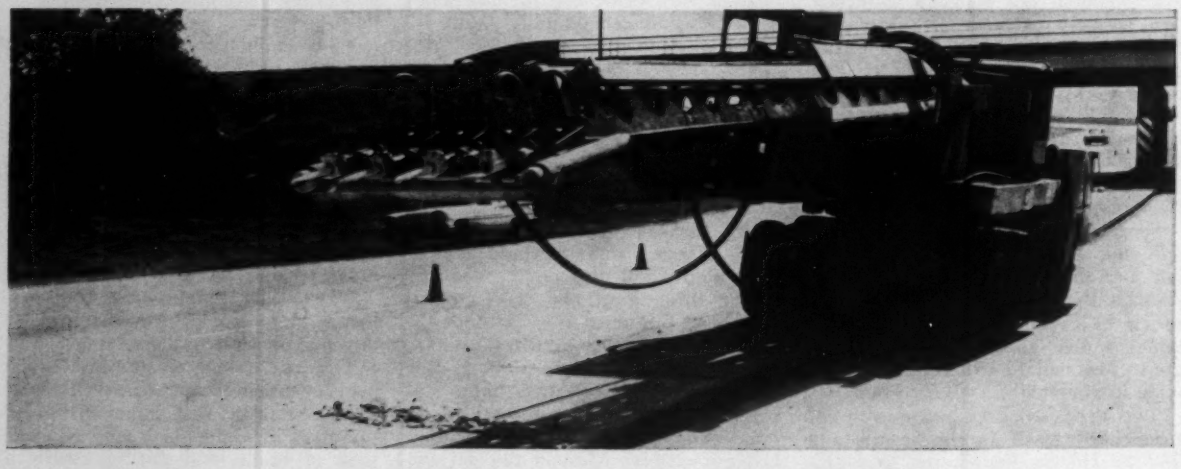
Climates varying from tropical to semitropical coexist simultaneously in one undivided space in the Climatron.

The climate is controlled by this process:

Outside air enters through a series of water sprays, heated in winter. As it passes through the greenhouse, the cooled, humidified air gains additional heat through solar radiation, conduction and heat emission by occupants and equipment. An independent heating system supplements these sources on cloudy days.

Discharged through five banks of individually controlled exhaust fans, air streams of varying temperature and quantity are combined to produce desired atmospheric conditions in different parts of the Climatron.

James Fitzgibbon of Synergetics, Inc., Raleigh, N. C., was structural consultant; Paul Londe of St. Louis was mechanical engineer. North American Aviation, Inc., of Columbus, Ohio, fabricated and erected the dome; and C. Rallo Contracting Co., St. Louis, did the foundation work.



Air Hammers Gang Up on Pavement

The Texas Bitulithic Co. of Dallas has equipped a Warner & Swazey Gradall with a four-gang air hammer attachment to break up and remove old concrete pavement.

Project manager J. T. Smith, who invented the attachment, says that the unit can also handle work on overhead structures. The basic machine powers the hammer gang.

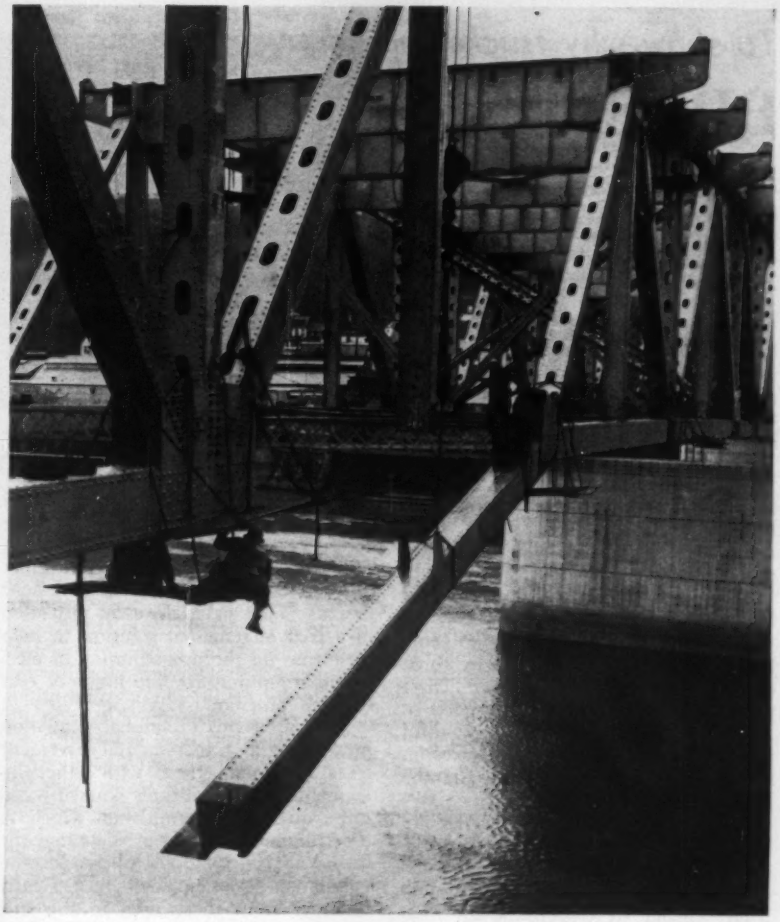
On an Interstate project near Dallas the contractor uses two machines of this type for grading, paving and installing storm sewers, in addition to removing pavement and old structures.

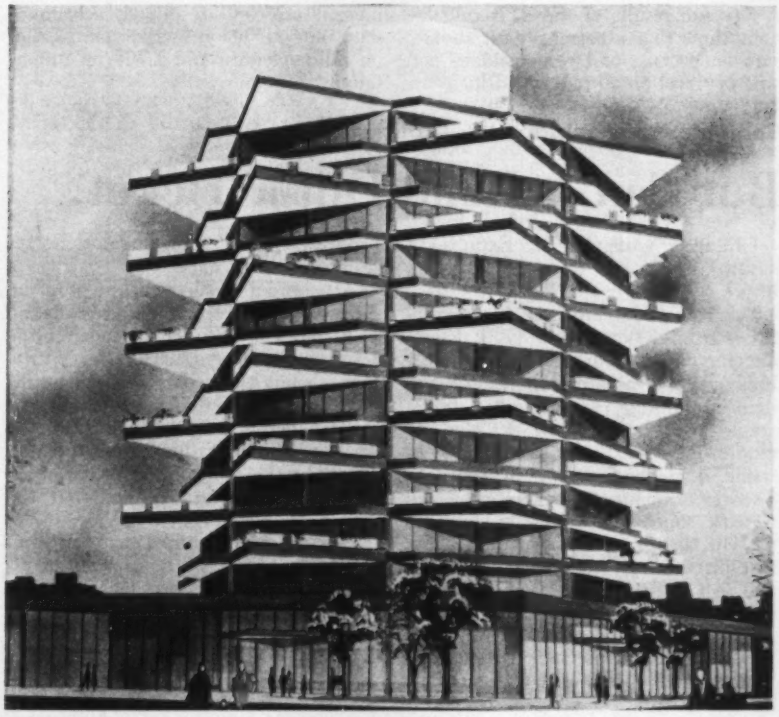
Lower Chord Closes New Link to Pittsburgh

Workmen ease a 50-ft-long, six-ton lower chord member into place as steel construction on Allegheny County's 62nd Street Bridge nears completion. The new four-lane bridge will replace a 60-year-old crossing of the Allegheny River to connect the Lawrenceburg section of Pittsburgh with the Borough of Sharpsburg.

After closing the gap in the middle of the river, American Bridge Co. crews will need to erect only 200 tons of a total of 4,900 tons to complete the steelwork. American Bridge fabricated the bridge superstructure at its Ambridge (Pa.) plant.

The bridge is being built under the supervision of Levi Bird Duff, director of the Allegheny County Department of Public Works. It is scheduled for completion later this year. Parsons, Brinkerhoff, Quade and Douglas, New York City consulting engineers, designed the bridge.





Floors Act as Sunshades In Florida Building

Designers of the 13-story Citizens National Bank building in St. Petersburg are alternating square floor plans 45 deg at each successive level to combat the Florida sun. Result: Four triangular canopies cantilever 20 ft beyond the octagonal interior plan at each floor and shade two floor levels below.

The canopies also serve as outside balconies. Shorter span canopies, wedge-shaped in plan, alternate with the balconies on successive floors.

Framing for the $3-million building will be structural steel with reinforced concrete floor slabs. Gray glass walls will help shade the interior.

A central octagonal core will house three elevator shafts, a stairwell, mechanical utilities and lobby space.

Architect is Harvard & Jolly, structural engineer is E. Reiss. Both are St. Petersburg firms. Florida Builders, also of St. Petersburg, is contractor.

To show why trucks should pay more . . .

BPR Beefs Up Its Road Cost Data

The Kennedy Administration is making a new effort to convince skeptics in Congress that taxes on heavy trucks should be increased sharply to help provide additional financing for federal-aid highways.

The Bureau of Public Roads has sent to the House Ways and Means Committee 40 pages of supplemental statistics, charts and explanation to bolster arguments made at recent public hearings.

The committee will resume its consideration of the President's tax requests this week after the House returns from its Easter recess. Mr. Kennedy is seeking $9.74 billion in additional revenue.

Two-thirds of the additional money he wants would be raised by keeping the federal gasoline tax at four cents rather than letting it drop to three cents on July 1, as now scheduled—a proposal the committee is expected to approve. The remaining one-third would come from increases in taxes on diesel fuel, tires, tread rubber and the gross weight of heavy trucks.

In the new data sent to the Ways and Means Committee, BPR went into detail on how it worked out the so-called incremental method of determining what vehicles are responsible for what elements of highway costs.

The method is based upon the fact that a portion of the design requirements and costs in building a highway are variable with the weight and size of vehicles using it. Thus, beginning with a basic design for passenger cars, the "extras" required to make the highway accommodate successively heavier vehicles can be measured in increments.

BPR told the committee it used three categories of costs in working out the incremental method: pavement and shoulder costs, bridge costs, and the combined costs of right-of-way, grading and drainage, utility adjustments, roadside development, traffic and pedestrian services and administration.

In the latter category, none of the items is affected by size and weight of vehicles, except grading and drainage. Therefore, the entire cost of these items was placed on the first increment and distributed according to vehicle-miles traveled without regard to size or weight.

During public hearings before the committee, questions were raised as to how BPR could complete the incremental cost findings without having available the results of the AASHO road tests at Ottawa, Ill. The tests were completed in November, but definitive results will not be available until early summer.

In its report to the committee, BPR made two points:

• AASHO test findings can affect the allocation of only little more than one-fourth of highway expenditures—the portion represented by pavement requirements. Nearly three-fourths of the expenditures are for right-of-way, utility adjustment, roadside development, administration and other items not affected by size and weight of vehicles.

• While it is true that final AASHO results are not now in hand, BPR received as early as last fall a preliminary equation from the tests used to compute incremental bituminous pavement designs. This material was in turn used in a trial incremental solution to help in setting up the programming of electronic computers for the highway cost research program.

BPR used this preliminary equation in working out incremental pavement costs, combined these with other incremental costs already known, and came up with a formula on which to base the new taxes. It predicts that the final AASHO equations will produce incremental pavement costs not greatly different from those used in the trial run.

The end results of the BPR calculations show that a passenger car should have an average cost responsibility per mile of travel on all federal-aid highway systems of 0.487 cents. A 40,000-lb tractor semi-trailer would have nearly three times as great a cost responsibility and a 72,000-lb truck, nearly five times as much.

On an annual basis, a passenger car traveling 9,600 miles should contribute $32 to the Highway Trust Fund under the incremental method; a 40,000-lb truck traveling 40,000 miles, $618; a 55,000-lb truck traveling 60,000 miles, $1,175; and a 72,000-lb truck traveling 70,000 miles, $1,917.

Under Mr. Kennedy's tax proposals the annual contribution for the same vehicle would be, respectively, $31, $637, $1,270 and $1,884. They're currently $29, $476, $700, and $1,040.

BPR said heavier trucks not only require increased structural strength of road surfaces, but also additional geometric design.

The bureau said trucks have a major influence on the need for added lanes, particularly on grades. On long, steep grades, for instance, a typical tractor semi-trailer combination can have the effect of 20 passenger cars even on a multi-lane highway, it said. In common rolling terrain, such a vehicle is the equivalent of four passenger cars.

A four-lane divided highway that can accommodate 3,000 passenger cars in all types of terrain can, when 10% commercial vehicles are added, accommodate only 2,700 on level terrain, 2,300 on rolling terrain and 1,700 on mountainous terrain.

Computer may replace the traffic cop . . .

But Can It Hand Out a Ticket?

Chicago's Congress St. Expressway has an electronic traffic cop in its future.

"What is contemplated is a predictive control system," says W. J. Payes, director of the Illinois Department of Public Works and Buildings. "Rather than attempting to unsnarl a traffic tangle after it has been detected by monitoring devices, the idea is to sense traffic flow continuously in order to discover incipient congestion and initiate control measures in time to prevent tie-ups from happening in the first place."

The Department's State Division of Highways in cooperation with the Bureau of Public Roads and the highway departments of Cook County and Chicago, will begin late this month a 15-month study of congestion on the expressway and instrumentation for traffic surveillance.

After an initial survey of the problem, engineers will recommend installation of traffic sensors, such as radar, ultrasonic and infra-red devices, at critical points along the expressway. These devices will feed traffic information to a central computer that will automatically analyze the situation over the full length of the expressway. When necessary, the computer will send out corrections to traffic control devices.

The engineers hope the electronic system will increase the capacity of the Congress St. Expressway by as much as 10% to 20%.

Ramo-Woolridge, a division of Thompson Ramo Woolridge, Inc., of Los Angeles, will provide technical assistance for the survey program.

Bids Out for Research Campus

First stage of the National Bureau of Standards' $104-million research center in Gaithersburg, Md., went out for bids last month. Contract award is expected around May 1.

The initial project includes an engineering mechanics laboratory, a radiation physics laboratory and a boiler plant. A $23.5-million federal appropriation includes construction and the cost of equipping the laboratories.

Ultimately the center will cover a 555-acre rural site located 20 miles from Washington, D. C. The new "campus" will incorporate 20 buildings housing new research facilities as well as all of the bureau's present laboratories. Construction subsequent to Stage 1 will include seven general-purpose laboratories containing 560,000 sq ft of floor area; an 11-story administration building with adjoining sections housing two auditoriums, a library, classrooms and laboratories; a complex of service buildings; and a fire research building.

Architects-engineers for the project are Voorhees Walker Smith Smith & Haines of New York City.

Volpe Wields His New Broom

Gov. John A. Volpe last week called for special legislation to permit a sweeping reorganization of the Massachusetts Department of Public Works.

In a special message to the state legislature, the governor said that "DPW operations in the past few years have been plagued by inordinate political pressures which have adversely affected both its efficiency and expedition of its work."

The governor, who is also immediate past president of the Associated General Contractors of America, proposed:

- Replace the present commissioner and two associate commissioners with a five-member board of administrators with broad administrative experience and background; not more than three would be from the same political party.
- Appoint an executive director to lead the department at a salary of $25,000 per year.
- Create four divisions within the department—highways, waterways, building construction, administration—each headed by a $17,500-a-year director.
- Transfer the present DPW Division of Beaches to the State Department of Natural Resources.

Under the Volpe proposal, the governor would appoint two of the five administrators for five-year terms. The governor would also name the other three, but they would serve at his pleasure for terms concurrent with that of the governor. The administrators would elect one of themselves as chairman.

The executive director would not serve any definite term, but his removal would require the votes of four administrators.

Governor Volpe announced he soon would submit another bill to have the Highway Construction Division of the Metropolitan District Commission, which has wide authority in the towns and city of Greater Boston, transferred to the Department of Public Works.

Master's Degrees Planned For AF Civil Engineers

Master's degrees in some branch of engineering will be required of all Air Force Civil Engineers by 1975. That's a major objective of a new set of educational standards for Engineer officers established recently by the Air Force.

The standards also seek to assure that most of the men will be in the "general practitioner" class, although a reasonable number of specialists will be allowed. A "general practitioner" or GP program will commence this fall at two universities, as yet unannounced.

Columbia Progress?

British Columbia offers Ottawa two alternatives

British Columbia last week offered the federal government in Ottawa two alternate courses of action that could break the stalemate over Canadian ratification of the U. S.-Canadian Columbia River Treaty (ENR Mar. 23, p. 42).

B. C. told Ottawa either to build the $485-million Columbia River development itself, or to guarantee the province low-cost power and permission to export surplus kilowatts to the U. S.

Although British Columbia's Premier W. A. C. Bennett attached strings to both alternates, observers view the offer with optimism. This is the first time B. C. has offered Ottawa the right to go ahead on its own in order to fulfill its side of the international treaty.

Early starts on three big dams in Canada and one in the U. S. hinge on Canadian ratification of the treaty. British Columbia has consistently exercised its provincial rights regarding issuance of water licenses and delayed ratification.

B. C.'s double-barreled ultimatum is a well-tied parcel. Mr. Bennett attached the following stipulations to a completely federal undertaking:

- The federal government would build and pay for all dams and transmission lines.
- Provincial residents who would be flooded out would receive "generous" compensation.
- B. C. would receive the $64 million in flood-control benefits paid by the U. S. and be allowed to invest this sum and use the earnings for flood damage compensation.
- Ottawa would pick up the $4-million tab for engineering costs for investigations made by the B. C. Energy Board.
- The dam and transmission lines would be turned over to the province free within 50 years, or as soon as the project has paid for itself.

Under the alternate plan whereby B. C. would build and pay for everything, Ottawa would have full access to engineering data and could "scrutinize and approve all contracts." But it must guarantee B. C. a price of 4.25 mills for Columbia power delivered at Vancouver. A final stipulation requires that Canada arrange for the export of any surplus power to the U. S. at not less than 4.25 mills.

There was no immediate reaction from either side to this latest development, but it is generally believed that the federal government is not interested in going into the Columbia power business, although anxious to see the project go ahead as soon as possible.

Around the World . . .

• **Authority authorization**—Delaware's General Assembly will consider a bill this month that would create a turnpike authority to build tollroads and bridges. The bill substitutes for a defeated measure that would have permitted the State Highway Department to finance a turnpike system through bonds.

• **Shelter-skelter**—A Housing developer in Thousand Oaks, Calif., near Los Angeles, will include a six-person fallout shelter in each of 1,250 houses built to sell at $17,000 to $30,000. Approved by OCDM as prime fallout protection, the shelters will go beneath garages.

• **Navajos steam ahead**—Construction has started on a 350,000-kw thermal generating station on a Navajo reservation in New Mexico. It will cost Arizona Public Service Co. some $62 million. They call it the Four Corners Power Plant. General contractor is Ebasco Services. Utah Mining & Construction Co. will supply coal and build a 1,200-acre cooling water reservoir.

• **Something for nothing**—Mayor John M. Babiarz of Wilmington, Del., has offered the U.S. government a gift of land on which the city would like the U.S. to locate an office building. Construction of the $7-million structure has been authorized by Congress. Lack of a site had held up the project.

• **Showcase**—Beginning this summer, a series of 30 product and material exhibit centers will be built across the country by Showcase, Inc., of Birmingham, Mich. Each will be of a 210-ft-dia geodesic aluminum dome.

• **Higher fees protested**—The Construction Industry Association of New Orleans, Inc., is protesting the increase in contractor license fees. The minimum charge was raised to $150 from $75 for jobs done in Louisiana costing $30,000 or more.

• **Big job coming**—Detroit's City Council approved a $200,000 design study for a Lake Huron water intake to serve Wayne, Oakland, Macomb and St. Clair counties. Construction cost may top $83 million.

• **Road program set**—Maryland's State Roads Commission will call for bids on about $33.5 million worth of highway projects in the five-county Baltimore region during the next 18 months.

• **The greatest**—A $29.6-million project will make London's south bank area "the greatest center of culture in the world." So says the London County Council in describing proposed additions to Royal Festival Hall that would include art galleries, recital halls, courts and terraces. If approved, construction will start this summer, end in 1964.

A First: Soil Cement for Dam Facing

The Bureau of Reclamation will use soil cement instead of riprap to protect the upstream slope of the mile-long Merritt Dam in Nebraska. This is believed to be the first use of soil cement as facing for a major earthfill dam. The departure will save the bureau $618,000.

The bureau authorized the use of the soil-cement-water blend for the dam on the Snake River after a satisfactory experiment on Bonny Dam in Colorado. Bonny Dam was partially faced in 1951 with 12% by volume soil cement. A core taken from the slope in 1959 was tested at 3,222 psi. Specifications on the Merritt project call for a 14% ratio of cement to soil.

The bureau's specifications on Merritt Dam called for 41,900 tons of gravel bedding and 82,300 tons of riprap with an alternate of furnishing 49,000 bbl of Type I cement and processing of 51,000 cu yd of soil cement.

Of the seven bidders, four did not bid on the riprap alternate while three submitted bids on both alternates.

Bushman Construction Co., St. Joseph, Mo., bid only on the soil cement alternate, presenting a unit bid of $5 for furnishing and handling cement and $3.50 per cu yd for processing the soil cement.

Bushman's total bid of $426,500 compared with a $1,044,522 low bid on the gravel blanket-riprap alternate submitted by J. H. Beckman Construction Co., Sioux Falls, S. D. Beckman's combined unit bid was $8.41.

The soil cement face will be placed not less than 2 ft thick, normal to the 4:1 slope. Placement will be in 6-in. horizontal layers stair-stepped back along the slope. On a 4:1 slope, this will mean each layer will be 8 to 8½-ft wide and successive layers will leave a 2-ft tread in the steps.

Kansas Finds a New Way To Boost Municipal Water

The Kansas legislature has taken action that could set a pattern for other states in getting municipal water supply capacity built into federal flood-control reservoirs. The legislature passed a resolution making the state itself the guarantor for the required local contribution toward the cost of five Corps of Engineers reservoirs. The usual local partner is a town or water district.

The state is acting because the opportunity is short-lived (it ends with construction) and there are no lesser entities at the moment with sufficient authority, financial strength and interest in the particular projects concerned.

The five reservoirs are Milford, on the Republican River; Perry, Delaware River; John Redmond and Council Grove, Neosho River; and Elk City, Elk River.

The legislature also approved a special study of how the state and its cities can pay their estimated $37.5-million share. A 1958 act of Congress permits payment to be deferred until the additional capacity is actually needed.

A few other states have taken some action to add storage capacity in federal reservoirs. California has contracted for irrigation storage in the Corps of Engineers New Hogan and Black Butte reservoirs and is negotiating with the Corps for irrigation storage in Terminus and Success reservoirs. Illinois has pledged repayment for storage in the Corps' Carlyle Reservoir.

New York's Building Code Finds a Permanent Home

The New York State Building Code had a close shave. Not until the closing hours of the 1961 session did the state legislature pass a bill giving the code a new lease on life and a permanent home.

If the bill had not been passed, the code, adopted by a 344 municipalities in the state and hailed as a national model code, would have been abolished.

Until 1959, the code had been administered by a building code commission. Then the legislature deposed the commission for budgetary and administrative reasons and assigned the code to the State Division of Housing on a year-to-year basis.

The new law makes the code a permanent assignment of the Division of Housing. But to preserve the technical integrity of the code, code-making power is vested in a seven-man council to be appointed to four-year terms by the governor. One member of the council must be a registered architect, and one a professional engineer. The Housing Commissioner is chairman.

How shopcoating steel shapes with X-L-O Primer cuts costs, saves time, gives 2-way protection...

▶ **Pittsburgh's X-L-O Structural Steel Primer** cuts costs, because it has exceptional "steel surface-wetting" characteristics that minimize the need for expensive cleaning with power tools or blast equipment before shopcoating. Simple hand cleaning is usually adequate, and saves money without sacrificing quality.

▶ **X-L-O saves time and keeps jobs on schedule** because it dries clear through so uniformly fast that you can ship fabricated parts within 24 hours, regardless of season.

▶ **There are no vulnerable "thin spots"** when you shopcoat with X-L-O, because it consists of 98% film-forming solids. This enables it to cover more steel per gallon, and coat even joints, mill scale and irregular areas uniformly with very little shrinkage from wet to dry stages.

▶ **X-L-O assures maximum protection** against corrosion—in transit, during erection, and for the life of the structure. It also protects further by providing such an excellent base for final coats that *their* resistance to weather-wear is definitely improved.

▶ **Only the finest extracted linseed oil** is used to make X-L-O, and you can get this well-known primer in combination of red lead and iron oxide or 100% red lead.

▶ **Would you like PROOF** that X-L-O Primer can guard your structural steel shapes better, for maximum useful life? Write, phone or wire Pittsburgh Plate Glass Company, Industrial Finishes, 1 Gateway Center, Pittsburgh 22, Pa.

Specify X-L-O—Another Example of PPG Research Leadership

● **New American Rapids Bridge** across the Niagara River. The structural steel in this bridge is shopcoated with Pittsburgh's X-L-O Primer and X-L-O Intermediate Primer. Bridge was designed by Praeger-Kavanagh, consulting engineers, and fabricated and erected by Bethlehem Steel Co.

PPG PITTSBURGH INDUSTRIAL FINISHES

PITTSBURGH PLATE GLASS COMPANY

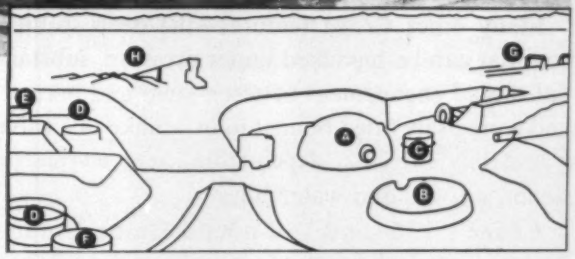
Titan underground missile base uses CF&I Steel Products

Vital to America's defense will be this completely-underground ICBM installation on the Lowry Bombing Range near Denver. It will comprise six complexes—one of which is pictured above—and each will be ready to fire three 98-foot long Titans. In building the complexes, which will occupy 875 square miles, the Corps of Engineers has used a variety of CF&I Steel Products — products known for their dependability.

CF&I Grader Blades and Cutting Edges gouged out huge excavations in which the installation will be buried. Thousands of tons of *CF&I Reinforcing Bars* fortify most of the concrete structures, including the launching silos and support installations. *Cal-Tie Wire*, in handy dispensers, was used to tie the rebars together.

Throughout the project, *CF&I-Wickwire Wire Ropes* were chosen for cranes, steam shovels and hoists, because these ropes have extra-high breaking strength and provide longer service life. *Realock Fence* and *CF&I Field Fence* guard the excavations and police "off limits" areas.

CF&I-Clinton Welded Wire Fabric was specified to give an additional steel backbone to many concrete structures, making them as "shock proof" as possible. The bases of the powerhouse and control center are further reinforced with *CF&I Hard Drawn Prestressed Concrete Wire for Redrawing. CF&I*



- A Power House
- B Control Center
- C Portal Silo
- D Launching Silos
- E Equipment Terminal
- F Propellant Terminal
- G Rebar Forming Yard
- H Sand and Gravel Quarry, Concrete Batching Plant

Prestressed Concrete Strand and Wire were also used in the concrete bridges on the entry roads.

CF&I Industrial Screens were selected for many sand and gravel separators. And *CF&I Galvanized Steel Strand* is prominent as guy wire on utility poles.

Whenever technical information is required on any product, CF&I engineers are ready to assist you. This service is available to all our customers. For full details about any CF&I product, call our nearest sales office.

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ANOTHER ACHIEVEMENT IN MODERN FLOW CONTROL BY CRANE

CRANE 125-AND 150-POUND UNION BONNET BRONZE GATE VALVES

STRONGER CYLINDRICAL BODY DESIGN FOR LONG SERVICE LIFE

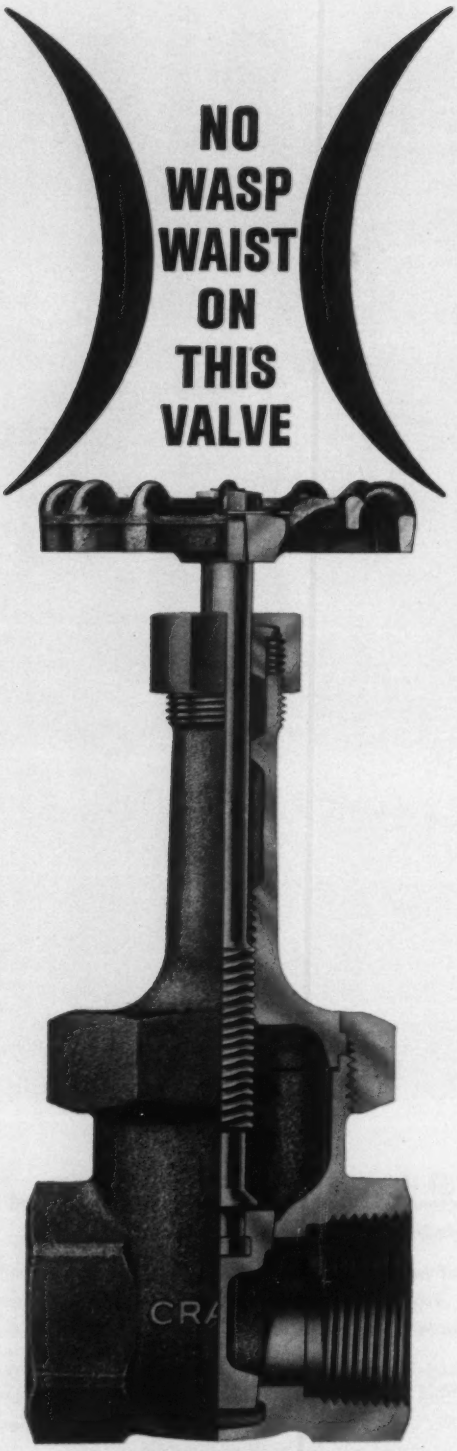
Every part of these new valves has been carefully engineered and liberally proportioned to assure an extra safety factor over the recommended working pressures. Unlike ordinary pinched-in, rectangular body valves, Crane's cylindrical body—the same design used in Crane's heavy-duty 200- and 300-pound bronze gate valves—distributes pressure loads uniformly and reinforces seat against the wedging action of the disc.

Wider, huskier hex ends combined with the new body shape give this valve greater rigidity, reduce chance of leakage and early failure resulting from piping strains. They make for easy installation, too.

Many other Crane features—the deep stuffing box that can be repacked under pressure, substantial thread engagement between stem and bonnet, and a precisely fitted bonnet joint—make this valve a best buy for safe, dependable, long service on steam, oil, gas and water lines.

Crane's 125- and 150-pound Union Bonnet Bronze Gate Valves are made in ¼-inch to 2-inch sizes with either a solid or split wedge disc. Both disc types are carefully machined and fully guided for positive, easy operation.

Your Crane Distributor has these new valves in stock. Contact him for information or write Crane Co., Industrial Products Group, 4100 S. Kedzie Avenue, Chicago 32, Ill. In Canada, Crane, Ltd., 1170 Beaver Hall Square, Montreal.



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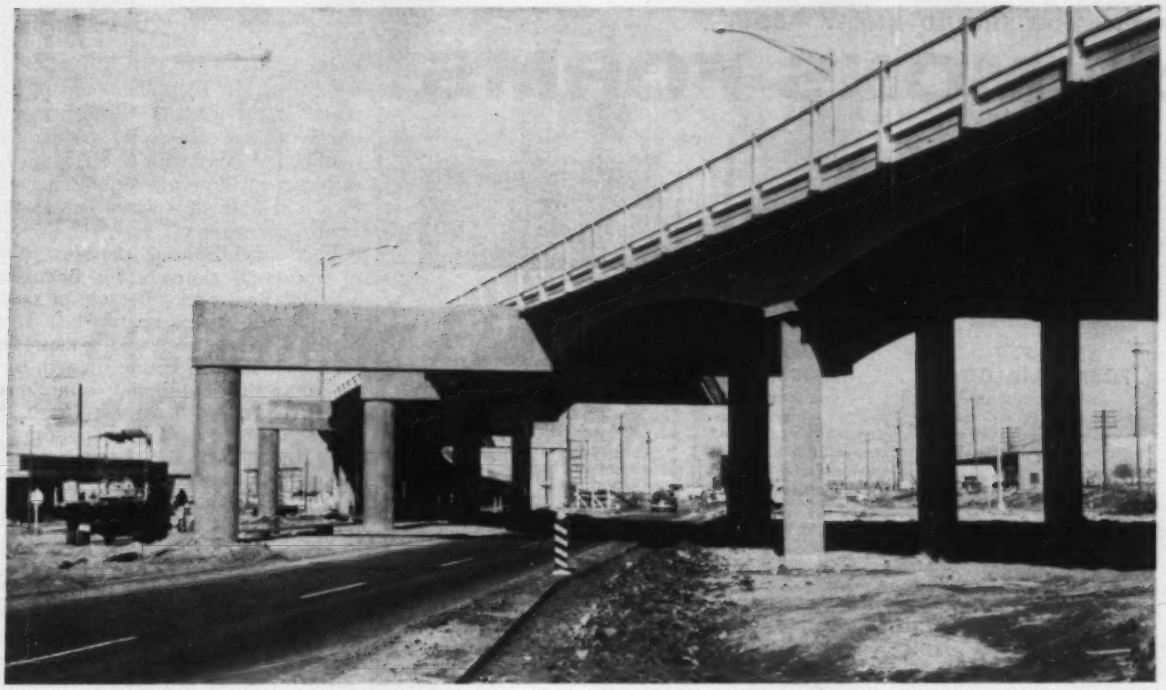


New structure carries two traffic lanes on Colorado Boulevard over divided arterial street.

Straddle Piers Span Denver Street

By Carlos D. Bullock

An economical solution to a perplexing problem encountered in designing a grade separation structure in Denver, Colo. was achieved by supporting a portion of the roadway on prestressed concrete beams resting on straddle piers.

The 1,044-ft long structure carries two lanes of traffic on Colorado Boulevard over a railroad and a four-lane expressway (Vasquez Boulevard) with a 28-ft median. It is built on a 3-deg spiralized curve and crosses the expressway at a skew angle of about 70 degrees.

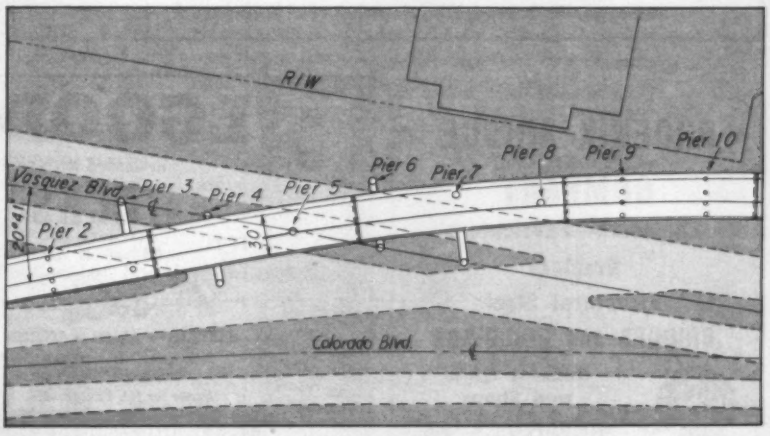
If conventional piers had been used, spans would have been as great as 190 to 200 ft.

To provide adequate sight distance, we kept the grade line as low as possible. For this reason, and to reduce costs, it was decided to build a 17-span continuous reinforced concrete deck girder structure; spans are 45, 12 @ 63, 45, 57, 80 and 57 ft. The structure was divided into six units by providing four intermediate expansion hinges in the 63-ft spans and an expansion joint at the pier between the 45- and 57-ft spans. Piers and abutments are integral with the superstructure.

The superstructure comprises four haunched tee girders spaced 9 ft 6 in. c-c. There is a 6½-in. slab between girders, a 2-ft wide curb on one side and a 4-ft wide sidewalk on the other. Total roadway width is 30 ft.

Maximum depth of girders is 6 ft at center line of piers, except for the 57-80-57-ft unit, where depth is 7 ft 4 in. at the piers. This unit spans the railroad, where clearance was no problem. The bridge is designed for AASHO H20-S16 loading.

Ten of the piers comprise four-column bents, with one column under each bridge girder. The remaining piers—all supporting the portion of the superstructure that crosses Vasquez Boulevard—are special cases. Piers 3 and 4 incorporate prestressed beams



COLUMNS IN THE MEDIAN reduced pier beam lengths and cost of the grade separation. Interference to traffic was reduced by design and unit construction.

Mr. Bullock, who designed the unusual piers, has more than 30 years' experience as a structural engineer. He is now designer of bridges for Burgwin and Martin, consulting engineers, Topeka, Kan.

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that straddle the northbound traffic lanes, with one column of each pier in the center of the median (see drawing). Pier 5 is a single column in the center of the median. Piers 6 and 7 use prestressed beams to straddle the southbound lanes with one column of each pier in the center of the median. Pier 8 is a single column set at the right clearance line.

Each straddle beam provides 44 ft of horizontal clearance for traffic on Vasquez Boulevard. Because of skew, beam length ranges up to 51 ft 3 in. Straddle beams were post tensioned with ½-in.-dia high tensile strength wire to reduce their depth and to minimize deflections. Depth of each pier beam is 6 ft; they were placed monolithically with the girders and do not project below the girders.

The structure is founded on a firm shale deposit located from 40 to 50 ft below the surface. Above the shale is coarse sand and gravel and fine sand with some silt and clay. Drilled caissons were used for all piers. All caissons were belled at the bottom to prevent pressure on the shale from exceeding 10 tons per sq ft.

Geometry of the structure is complex. The south 103 ft is on tangent, then a 300-ft spiral, 592 ft on a 3-deg circular curve, followed by the final 49 ft on the other spiral. Piers and abutments are built on radial lines. Girders are straight between supports with curbs and railings parallel to the bridge centerline. Maximum roadway superelevation is 0.04 ft per ft, with a transition to 0.015 ft per ft slope in the opposite direction on tangent.

The complicated layout made necessary a large number of calculations to determine offsets from girder to curb, column locations, clearances, spirals, and other details. These computations were done on an IBM 610 computer. Part of the design also was done on the computer, including computations of influence line ordinates for moment and shear, and stress analysis of the columns.

John W. Brown Construction Co. of Denver built the bridge under a contract price of $306,538, or $8.16 per sq ft of deck. Construction of the bridge in units allowed maintenance of traffic on Vasquez Boulevard most of the time; short shoo-fly detours were necessary during construction of the first three units.

William H. Burgwin, Denver, was consultant to the Colorado Department of Highways on the project. Mark U. Watrous is chief engineer of the department, A. D. Newbold is bridge engineer and F. K. Merten is district engineer. King Burghardt was bridge engineer for the Bureau of Public Roads in Colorado.

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CASTING MACHINE can be transported for site production of ties.

An American company has developed an automated machine capable of individually casting nearly 140 prestressed concrete railroad crossties per hour.

The American Concrete Crosstie Corp of Tampa, Fla., developed its machine in response to the demand for a crosstie known as the MR-1; which had been approved by the Association of American Railroads after a long testing program. Many foreign crossties were tested in this program.

Shortages of quality timber have sparked the railroads' search for a substitute crosstie material. Moreover, the use of concrete eliminates many of the traditional problems associated with timber (e.g., splitting, crushing, decay). Experience has shown that concrete crossties must be prestressed to withstand heavy loads and continual, lifelong punishment.

Prestressed concrete crossties can now compete economically with timber crossties since the AAR has established a 30-in. spacing for the MR-1. This greater spacing reduces by one-third the number of tie units required by the 20-in. specified for timber crossties. Moreover, the 75-year life estimated for an MR-1 is more than double the 35-year life estimated for a timber tie.

The MR-1 is 8½ ft long, trapezoidal in cross-section at its end, where it measures 7 in. deep with an average width of 10½ in. It is not prismatic, tapering from the ends to a smaller central cross-section.

The casting process works by rolling a rail-mounted pallet, which forms the bottom of the crosstie, into the concreting machine. There the prestressing strands are placed and pretensioned, a dry 8,000-psi mix is placed, and the crosstie is moved to the curing chamber. A steel box forms the crosstie's top and sides. The automated production cycle, from pallet entry to removal from the casting station, takes only 26 seconds to produce one crosstie.

An important problem concerned the method of anchoring the steel strand ends to the pallet during the 14-hour curing period. Within a 9-sec interval, the strands are automatically fed into the pallet, measured and cut with .01 in. tolerance and locked into end anchors. Hydraulic jacking proved the best method of prestressing, with one fixed and one movable header on the pallet.

The four strands of each MR-1 provide centroidal prestressing in the end

Prestressed Concrete Rail Ties

sections of the crossties. The $\frac{7}{16}$-in. strands have an ultimate strength of 180,000 psi. Initial prestress is 135,000 psi.

The pallet had to resist the total prestressing force of 82 kips and also to withstand the heat-humidity of accelerated steam curing. Experimentation led to the substitution of glass fiber and rubber for the steel castings originally used to line the pallet.

Another difficult problem was how to vibrate the stiff concrete mix. This, too, entailed extensive experimentation before a satisfactory combination of frequency, amplitude and pressure was found. External vibrations are transmitted through a vibrating table below the tie and a pressure plate above it.

Automation is used throughout the production cycle. Hydraulically powered cranes carry the pallets in and out of the concreting station. Abrasive saws automatically cut the strands after the crossties are removed from the curing chamber, where 540 crossties may be cured during each 14-hour cycle. Electronically controlled transfer cars, each carrying 36 crossties, transport them to the storage area.

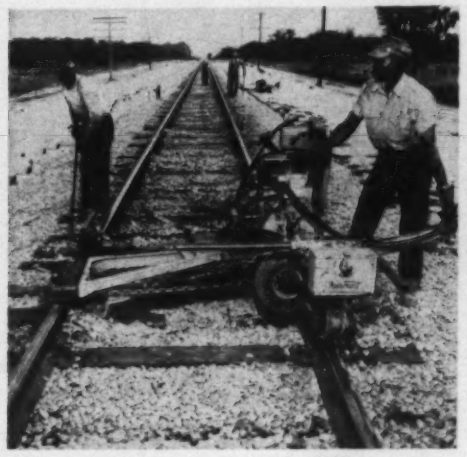
Third problem that had to be solved to make the MR-1 crosstie marketable was how to anchor the rails. These connections must absorb tremendous vibration and acceleration forces.

The American Concrete Crosstie Corp., working closely with railroad engineers, produced a special wedge anchor that can be inserted and removed from the top surface of the tie.

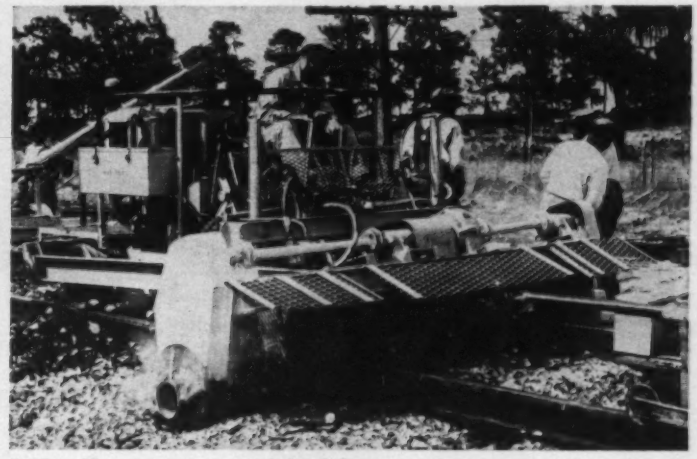
The entire clip assembly for anchoring the rails comprises a standard hexagonal-head bolt, plate washer, insulating thimble, rail clip, tie plate and tie pad. Following the highly mechanized process of removing the old timber ties (see accompanying photos), workmen tighten the anchor bolts with power wrenches.

The MR-1 crossties are presently in use on U.S. railroads from coast to coast. Negotiations currently under way would extend their use into several foreign countries.

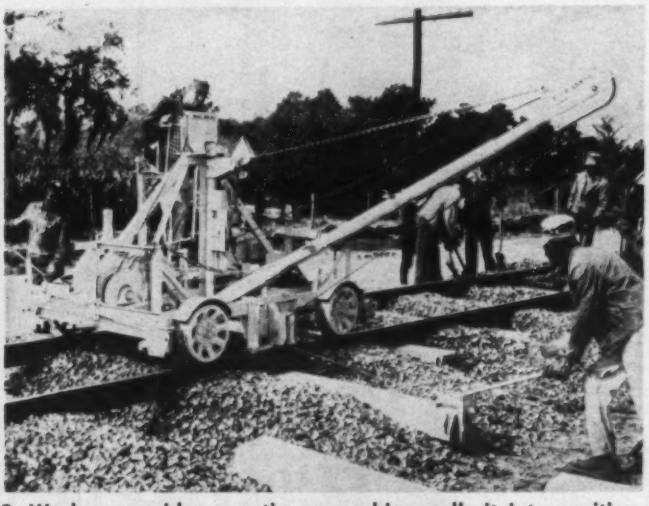
Here's how the concrete ties are installed



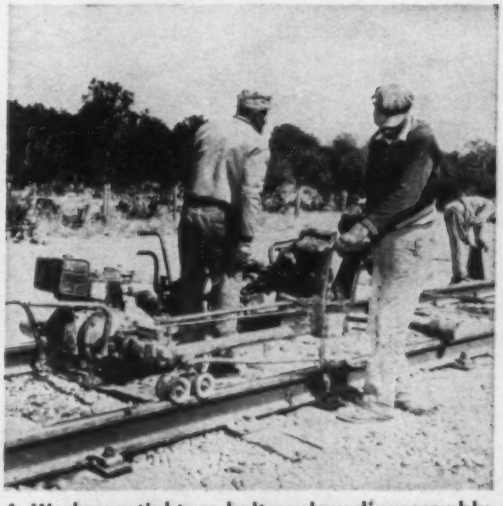
1. Hydraulic-power removes old ties.



2. Scarifier prepares track bed for new ties.



3. Workman guides crosstie as machine pulls it into position.



4. Workman tightens bolt anchor clip assembly.

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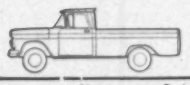
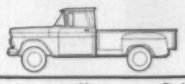


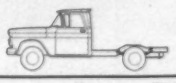
Model	Max. Load	Body Length
K1434	1400 lb.	6½′
K1534	1300 lb.	8′
K2534	2950 lb.	8′

STEPSIDE



Model	Max. Load	Body Length
K1404	1450 lb.	6½′
K1504	1350 lb.	8′
K2504	3050 lb.	8′

CHASSIS-CAB



Model	Max. Load	Wheel-base
K1403	1900 lb.	115″
K1503	1850 lb.	127″
K2503	3500 lb.	127″

PANEL CARRYALL

Model	Max. Load	Body Type
K1405	1300 lb.	7½′ Panel
K1406	1000 lb.	Carryall (panel type rear doors)
K1416	1000 lb.	Carryall (tailgate and liftgate)

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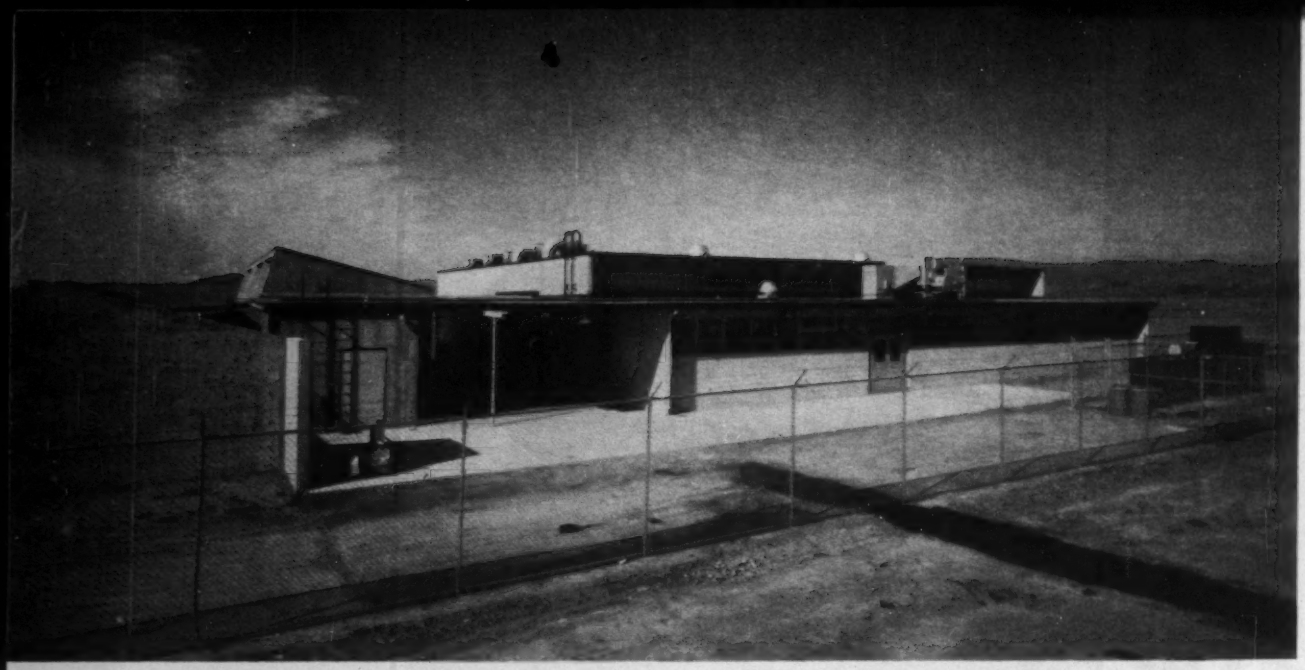
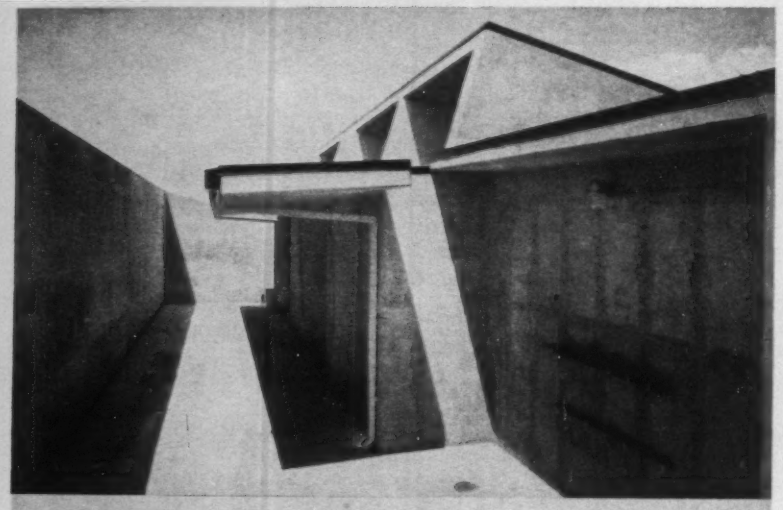
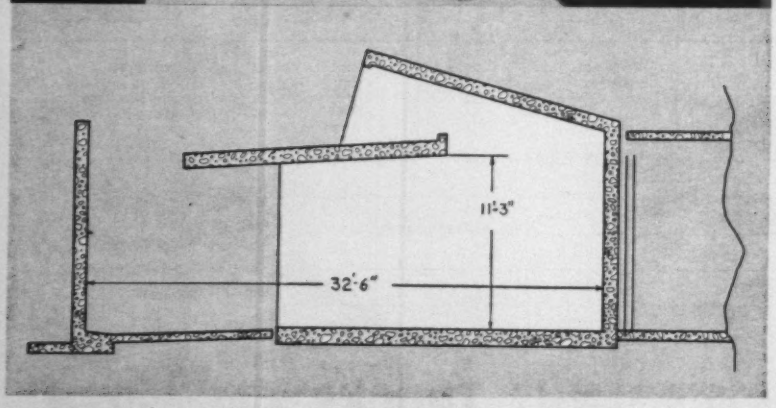


New building for Lawrence Radiation Laboratory will be used for high-pressure tests.

Designing a Laboratory Building





Enclosure of hazardous-gas cells lets out gas, but not debris.

By Frank H. Miars and Carl B. Sanford

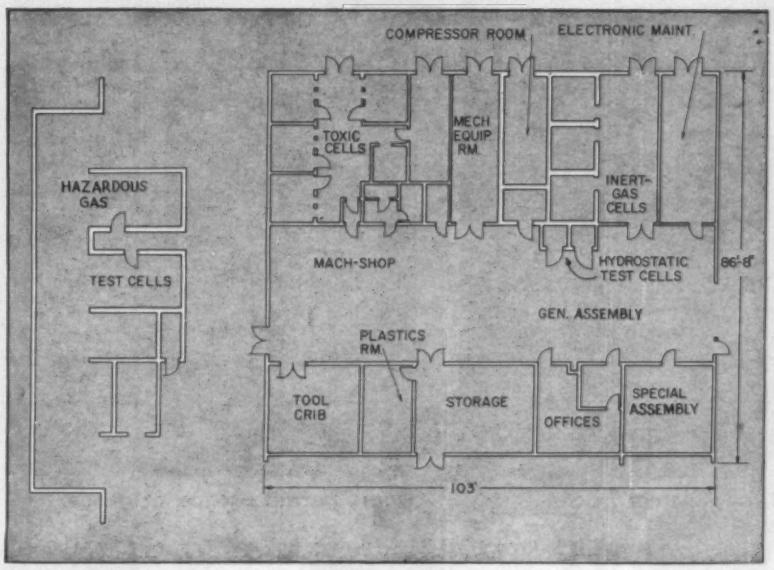
Many unusual design features are incorporated in a 103x86-ft, one-story laboratory building constructed for the Lawrence Radiation Laboratory at Livermore, Calif. The structure will be used for high-pressure testing of mechanical systems and components.

The unusual features result from the necessity of protecting personnel and equipment from potential hazards.

High-pressure systems, both gas and hydraulic, will be tested under pressures up to 150,000 psi. Components of these systems include pressure vessels, piping, valves, controls and instrumentation, both contact and remote.

Hydrogen, argon, nitrogen, helium, oils and oil-water mixes provide the means for testing components of various metals and alloys. Since the design and fabrication of most of these components are empirical, no performance data exists that can be used to confirm design calculations. It is the function of the test facilities to supply these data—to determine the feasibility, safety and reliability of the systems. The technicians also will supply various scientific

Mr. Miars is a technician supervisor and Mr. Sanford a mechanical engineer at the Lawrence Radiation Laboratory, Livermore, Calif., which is operated by the University of California for the Atomic Energy Commission. Their studies influenced the design of the high-pressure testing laboratory described in this article.



Hazardous-gas cells are separated from other test spaces.

for Risky Research

groups with high-pressure pumping and sources of extreme pressure of various media, together with the necessary environment within which experimental research may be conducted.

Before this facility was designed, almost all available information dealt with high-pressure laboratories used for chemical processing work and not for mechanical testing. Yet, the two types of laboratories differ: Mechanical testing may require the deliberate bursting of pressure vessels and components with both hydraulic and gas media; chemical processes would not. Mechanical testing would not normally require use of reactive media where secondary explosions are of major concern; chemical processes frequently employ such media.

The equipment needed also differs. Rocker bombs and stirred autoclaves, used extensively in chemical processing, are not employed for mechanical testing.

However, fundamental requirements for barricading and general safety practices are much the same in both types of laboratory.

• **Built-in safety**—Primary consideration in the design of the high-pressure facilities was safety for personnel. Unusual hazards are necessarily encountered in the performance of high-pressure testing. The risk of failure in test is always comparatively high, and the potential destructiveness of a failure is appreciable. In addition to energy and fragment release, there are unusual hazards, such as toxicity and radioactivity associated with the materials tested.

Most of the one-story building is framed with structural steel supported on reinforced concrete footings, and the roof is an insulated steel deck. However, the inert-gas, hydrostatic and hazardous-gas cells have reinforced concrete walls, floor and roof. Walls and doors in these areas are designed to sustain the shock of energy and fragment releases, and the hazardous-gas cells are designed to prevent concentrations of gas from remaining in the cells. Exterior walls are concrete block.

Of course, intelligent, well trained personnel are the most important safety asset. But in addition, special precautions have to be taken:

- Sturdy barricading of areas of potential danger from explosions and fragments traveling at high velocity.
- Low employee density in high-hazard areas.
- Isolation of extreme-hazard areas.
- Prevention of the spread of contamination in areas where toxic media are in use.

In addition, other safety features were provided in this facility: Each cell has access to the outside as well as to the main bay. All blast doors are equipped with locks so that only the man conducting the test has access to the cell. Cells are locked at all times and keys are kept in the main office. Locked chain-link gates are installed at each access to the passageway behind the hazardous-gas cells.

A special stainless-steel solvent wash tank is located in an exhaust booth. All solvents are stored in a special area outside the building. Also, an eye wash and an emergency shower are located near the acid dip tanks.

• **Hazardous-gas areas**—Separate facilities are provided for each of the four categories in which the tests may be classified: testing with hazardous gases, such as hydrogen; testing of components made of toxic or radioactive materials; testing with inert gases; and hydrostatic tests (see plan).

The hazardous-gas area (at the left in the plan) is separated from other facilities by a covered space. This acts as an open-air buffer zone, separating a potentially explosive environment from high-employee-density space.

The two hazardous-gas cells are 12 x 21 ft by 12 ft high to the ceiling. Walls are 12-in.-thick reinforced concrete on three sides. The fourth side is open and faces a 13-ft-high, 12-in.-thick reinforced concrete wall. The opening is covered with a fireproof canvas curtain.

The roof is 12-in. reinforced concrete. It is so shaped that no fragments can get out; yet it will not allow a concentration of gas to remain in the cell (see cross section).

Each cell is provided with a steel blast door for personnel access. Piping is supported on light-gage steel struts embedded in the walls and ceiling, and it passes from one cell to another through a 2x1-ft opening near the top of the walls, which is sealed with a ¼-in. steel plate. Each cell is equipped with an I-beam and 1-ton chain hoist. Cells are designed for an overpressure of 1 psi.

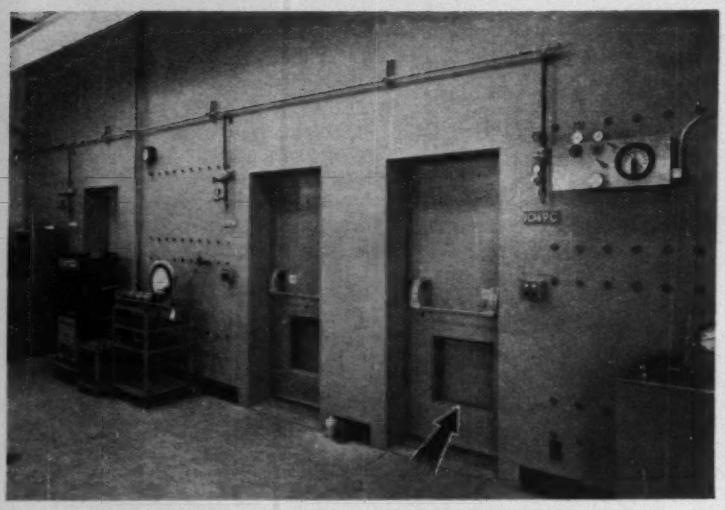
A compressor cell, for diaphragm compressors, as well as a vacuum-pump room, are located next to these test cells. The compressors will be operated from behind an 8-in.-thick concrete wall.

Connections to control equipment, such as valve actuators, pressure gages, electrical apparatus, are brought into the operating area through fifty 1¼-in.-dia pipe sleeves embedded in the concrete wall.

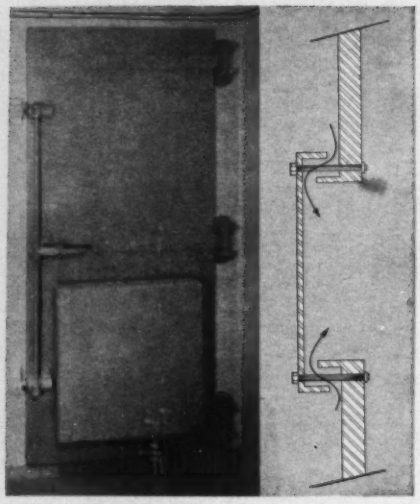
• **"Toxic" cells**—Four radioactive and toxic-material cells are located in one corner of the main building. They were designed for special air handling and ease of decontamination.

These cells are 10 x 10 ft by 10 ft high. Walls are sheetrock with a vinyl sheet surface. Floors are covered with linoleum. Each cell has an I-beam and one-ton chain hoist.

Cells are air conditioned and provided with filter exhaust systems. Testing will be done in containers attached to gloved boxes. Negative pressure is maintained in these boxes and the test cells during operation. Pressure testing is observed from an access corridor



Access to high-pressure cells is through steel doors.



Doors permit escape of gases.

through safety-glass windows in the cell walls.

• **High-pressure cells**—Three normal high-pressure cells are enclosed with 12-in. reinforced concrete. They are used for gas rupture testing to 30,000 psi and isostatic pressing to 150,000 psi.

Cells are 10 x 10 ft by 15 ft high. Each has light-gage steel struts embedded in the walls for supporting piping. Fifty 1¼-in. pipe sleeves are provided for valve handles and gages. Pipe enters the cells through a 12-in. pipe trench, which parallels the front wall.

Personnel access to each cell is through a steel blast door. In the ceiling of each cell is an 18 x 18-in. opening covered with a corrugated, reinforced plastic panel for release of overpressure. Cells also are equipped with an I-beam and one-ton chain hoist.

• **Hydrostatic test cells**—Two hydrostatic test cells are located in the main bay. They were designed for fragment containment. Walls and ceiling are 8-in. reinforced concrete. The inside is lined with 1-in. tongue-and-grooved wood.

Each cell is provided with a floor drain and six 1¼-in. pipe sleeves in the walls.

• **Other unusual spaces**—The inert-gas cells were designed to allow for expansion of gases and to insure fragment containment if a blast occurs.

The compressor room, located next to these cells, houses a 30,000-psi compressor providing helium to them and a 5,000-psi compressor supplying helium to the toxic cells. The compressor room is enclosed with 12-in. reinforced concrete. It is 10 x 24 ft by 15 ft high. High-pressure gas reservoirs are stored on a balcony at one end of the room. In the outside wall is located a 7 x 7-ft blowout panel covered with a corrugated plastic.

The machine shop and assembly areas, located in the main bay, are equipped with a five-ton electric bridge crane with a 100-ft-long runway. Besides standard machine tools, this area also contains two exhaust booths for soldering, acid-dip and degreasing operations.

Because considerable use has been found for plastics in high-pressure experimentation, a work area was designed for plastics preparation.

• **Blast doors are vented**—Blast doors are constructed of ½-in.-thick steel plate. Each door has a 20-in. opening in it for release of gas overpressure.

However, to prevent passage of fragments, the opening is protected. A 3½x½-in. steel plate spacer lip surrounds the opening, extending into the cell. And a 27-in. square plate, ½-in. thick with a 3½-in. lip, is fitted over the opening. This construction allows a 3-in. space for release of gases but blocks fragments.

• **Utilities**—The building is supplied with air, domestic and low-conductivity water, gas and electricity. Air lines are installed to each cell and shop and also are placed in the floor of the main bay. In addition, an emergency 60-kw diesel motor-generator set has been installed.

The building is heated, ventilated and air conditioned. Heating is accomplished with a gas-fired package hot-water boiler and circulating pumps. The cooling-water system includes a package water chiller and circulating pumps.

A washed-air system for the shops consists of an air washer, complete with filters, cells, eliminators, hot-water tempering coil and fan section. The last includes an air duct to each room, a booster coil and two exhaust fans.

The air-conditioning system for the inert-gas cells includes an air-conditioning supply unit, exhaust-fan unit, and supply and exhaust ductwork with a recirculating arrangement.

Special once-through air-conditioning systems are installed for the toxic cells. Each consists of an induced-flow (no fan) supply assembly, with filters and heating and cooling coils, and an exhaust assembly with high-efficiency filters and weighted intake dampers for emergency exhaust.

A total of 225 kva of electrical power is available at voltages of 480/277 and 120. Three-phase is supplied at the higher voltages. Lighting fixtures in the hazardous-gas cells are of the explosion-proof type.

A fire-detection and alarm system is installed in all cells, shops and offices. This closed-circuit system operates at 24 v dc. Tripping of a manual alarm station or automatic detector sounds alarm bells and, by means of interlock relays, stops certain ventilating fans.

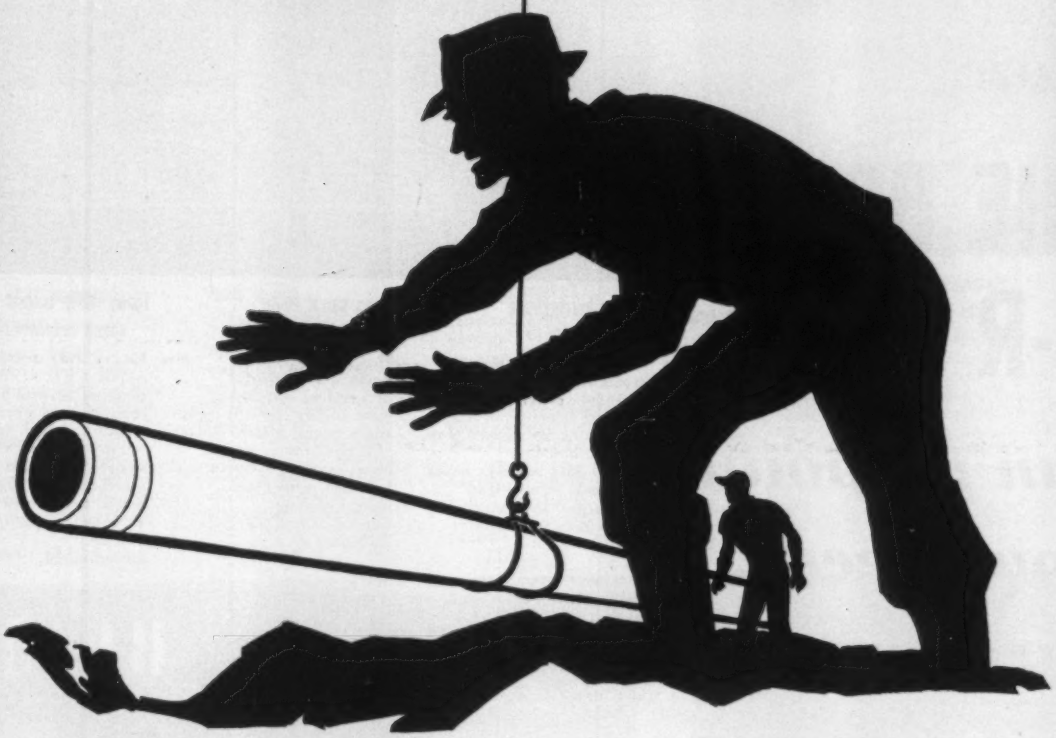
Two parallel underfloor duct systems for power wiring for machine shop tools are installed in the main bay. They are 1¼ x 3⅛-in. in section. Each system has a 2-in.-dia access opening every 24 in.

Because the building is in a remote location, extra office space was incorporated. This is available for use by visiting engineers and physicists.

The design permits expansion of all test facilities, should that become necessary in the future.

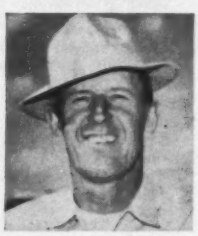
Gallis & Wright were the architects, Ellis Sedgwick & Associates were the structural engineers and G. M. Simonson was the mechanical and electrical engineer. All are San Francisco firms. Payne Construction Co., Oakland, Calif., was the general contractor.

A contractor from Arizona reports:



"In only 8 hours, we installed 7,100 feet of Transite Water Pipe."

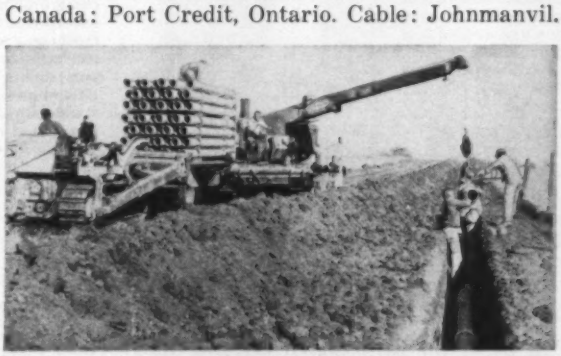
Jay Baldwin, Supervisor,
E. P. Hunziker Construction Company, Tucson, Arizona



"We achieved the phenomenal installation rate of up to 947 feet in one hour on a 12-mile Transite Water Pipe job for the Oracle Village Water Company. Since the job called for stringing out the pipe, excavating, fine grading the trench bottom, installing, testing and backfilling, it took a well-planned operation and excellent teamwork by everyone concerned to get this rapid installation. Of course, a very large part of the credit has to go to Transite Pipe itself. Its long lengths, light weight and speedy coupling methods got the job done quickly, with a minimum of effort and with virtually no manual handling of the pipe.

"After completing each 1000 feet, we tested the line. The result? Not one leak in the entire 12 miles. I'm convinced that for fast, sure results, you can't beat Transite Pipe."

For the full Hunziker and Transite® story, write Johns-Manville, Box 14, EN-4, N. Y. 16, N. Y. In Canada: Port Credit, Ontario. Cable: Johnmanvil.



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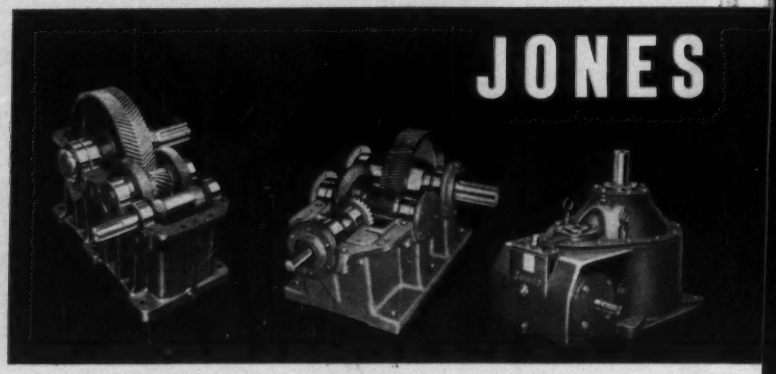
can pinpoint your needs, save you time and give you off-the-shelf savings.



Jones herringbone reducers...

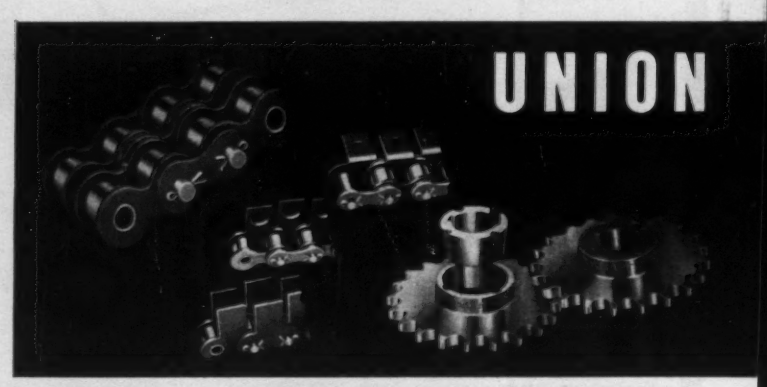
Ruggedness and reliability, known throughout industry. Widest selection of sizes and ratios. Balanced design, rugged housing, heavy-duty bearings mean efficient, trouble-free operation, and longer life. Capacities to 1,672 hp. *Bulletin J-100.*

Jones spiral bevel speed reducers...

Most-up-to-date design. Horizontal or vertical outputs. New, highly efficient right angle drives. Matched sets of high-hardness spiral bevel gearing, oversize bearings, alloy steel helical gearing. Capacities to 1,050 hp. *Bulletin J-25.*

Jones worm helical speed reducers...

Heavy duty service. Applicable to a wide range of vertical drive requirements where medium to high speed reduction ratios are needed. Available in low speed shaft extension up, down, and double extended. Capacities to 175 hp. *Bulletin J-14.*



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Over 98% efficient. Union ASA standard roller chain transmits more horsepower in less space than many other mechanisms. Available in outstanding range of pitches and widths, ASA standard and ASA heavy series, and extended pitch. *Bulletin RT-60.*

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An almost unlimited variety of unusual drive and conveying problems can be solved with standard or special attachments by Union Chain. *Bulletin RT-60.*

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Complete range of stock and special sprockets for all chain applications. Precision teeth, tough, durable body, proper tooth surface hardness make for long life and economy. Available also in Taper-Lock bushings. *Bulletin RT-60.*

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to select the ratio, capacity, and design closest to your needs . . . directly from H-R standard equipment . . . and at "off-the-shelf" savings.

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Availability? H-R warehouses, sales offices, and stock-carrying distributors spread a strategic network from Coast to Coast. There is a team of H-R

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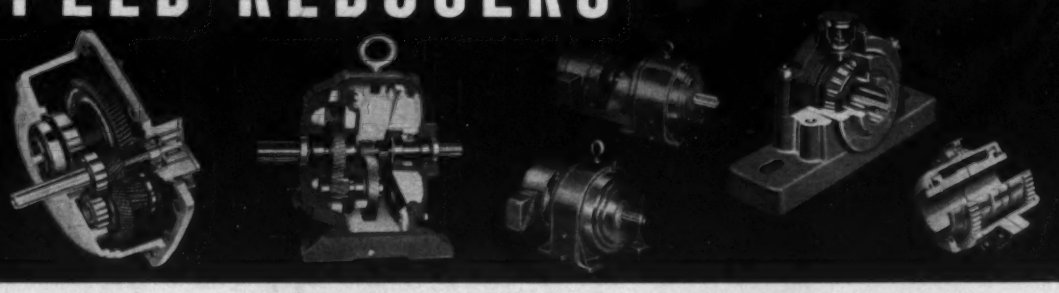


Jones shaft-mounted reducers...

Compact design for confined areas. High hardness gearing for long life. Double lip oil seals, anti-friction bearings, automatic overload mechanism, positive lubrication. Torque-arm for simple belt tensioning adjustment. Capacities to 40 hp. *Bulletin J-19.*

Jones in-line helical reducers...

Standardized components, both in-line and right angle reducers to meet any drive requirement. Easy-to-change ratios. One-piece, cast housing, positive gear and shaft alignment, reliable oil-sealing. Capacities to 147 hp. *Bulletin J-18.*

Jones gearmotors...

Horizontal or vertical, flange or foot-mounted. Two basic types: *All-motor* . . . has motor mounting bracket for foot-mounted motor. *Integral* . . . incorporates flange-type motor bolted directly to gearhead housing. *Bulletin J-17.*

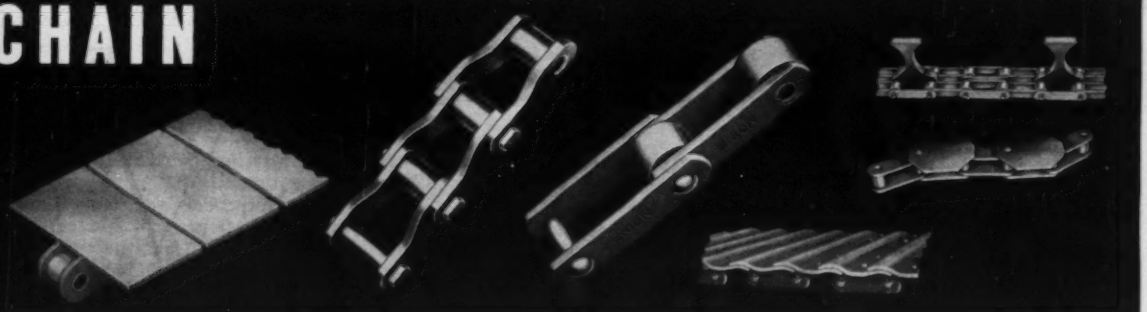
Jones power transmission components...

Pillow blocks for heavy-duty service. Timken tapered roller bearings, two-piece, cast iron housing, shaft sizes from 1 15/16" to 9". *Flexible couplings,* gear tooth, fabric disc . . . *V-belt drives . . . cut tooth gears . . . cast iron pulleys. Bulletins J-10A, J-16, J-23.*

Jones complete drive units...

Safe, efficient special drives, feeder tables, car pullers, door, boom, and skip hoists. Feature rugged reliability of Jones speed reducers. Standard lines available or modifications of existing equipment at considerable savings. *Bulletins J-11, J-22.*

CHAIN



Union ASA standard flat top roller chain...

Now available in Delrin, (as well as other materials) reduces breakage and eliminates corrosion problems in many food, beverage, and pharmaceutical conveyor applications. Available in many combinations of chain and materials. *Bulletin RT-60.*

Union HB steel drive chain...

At home in heavy duty service, such as cement mixers, cranes, shovels. Offset side-bar adds to flexibility. Hardened bearing for rugged wear. Pitches from 1.6" to 6.0". Average ultimate tensile as high as 420,000 psi! *Bulletin A-4.*

Union HB steel roller chain...

Low ultimate cost in all types of elevating and conveying duty. Hardened alloy steel bushings, uniform wearing surfaces, true pitch accuracy, tight fit of pins and bushings. *Bulletin A-4.*

Union apron conveyors...

Many types available. Union apron conveyors for bulk or packaged materials. *Bulletin A-4.*

Union "Made-to-order" chain...

Meet unusual requirements. Union Chain Division of Hewitt-Robins, unlike many manufacturers, is able to design and produce special chains to meet special needs. *Bulletin A-4.*

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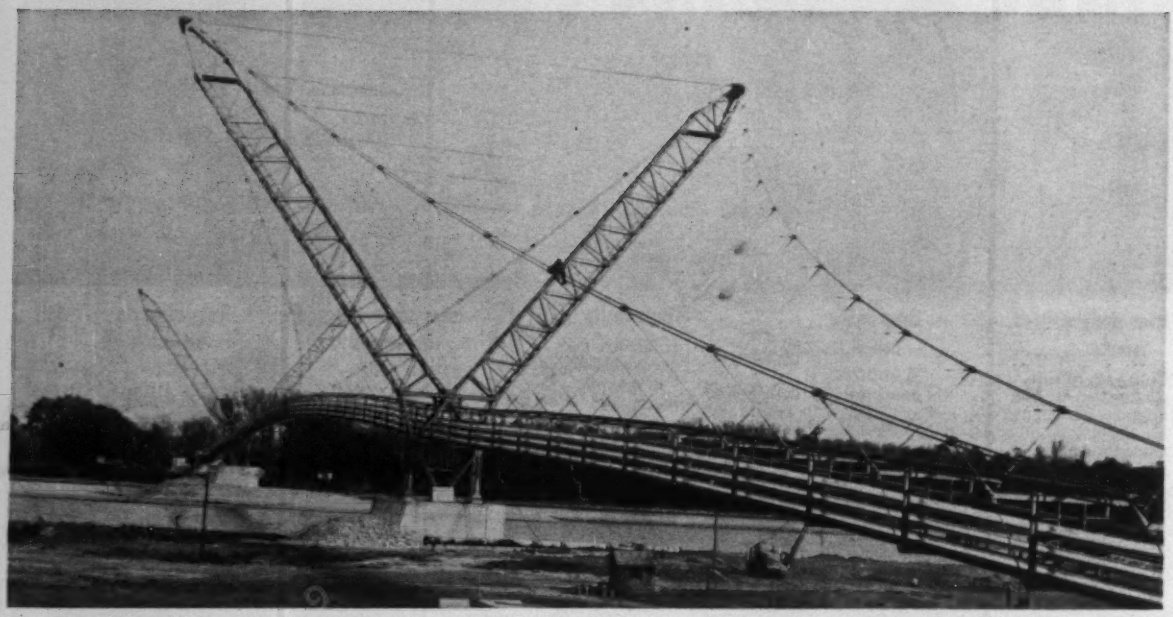
Signed_____ Title_____

Company_____

Address_____



Petroleum products travel both ways across the Danube on this unusual bridge.

Pipeline Bridge Hangs From

An unusual, 1,608-ft-long suspension bridge carries thirteen pipelines across the Danube River three miles south of Vienna. It's unusual in that the cable suspension systems are swung from Y shaped pylongs in sloping, rather than vertical, planes and the opposing suspension systems are tied together at the center of the main span where they almost meet.

Among the many advantages claimed for the peculiar design are fast, economical construction and tremendous inherent stability.

As proof of these claims, the Waagner-Biro, A.G., of Vienna, designer and builder of the new structure points to the record of a single-pipe prototype constructed by them three years ago about three miles downstream from the new bridge (ENR Oct. 2, 1958, p. 24). The older bridge, which is smaller and lighter, carries one 16.26-in.-dia pipe for natural gas under 910 psi. It was erected in 1957 in 2½ months and has since been trouble free. According to Waagner-Biro, its "three plane projection" of the suspension cables results in a structure that will be stable even under winds of 115 mph and at temperatures ranging from −13 deg F to 130 deg F.

The new bridge embodies the same principles and, according to Waagner-Biro, has the same merits. It has a main span of 853 ft, two side spans of 377 ft 4 in. each. Heart of the structure is a pair of Y-shaped pylons reaching 132 ft 4 in. above the water. Pylon arms, set at a 75 deg angle to each other, are 173 ft apart at the top.

The pylons are set on a sheetpile-protected concrete foundations, each capable of sustaining more than 550 tons. (The bridge, including its towers, cables and pipe frames—without pipes—weighs 369 tons; the 13 pipes add another 215 tons.

The anchor blocks at each end of the structure serve two purposes: they provide resistance to horizontal forces in excess of 727 tons for the four upper carrying cables and two base-mounted stabilizing cables; and they provide a protected connecting point for the pipe bundles where they come out of the ground to go over the bridge.

The suspension systems consists of four main cables, each 2⅞ in. in diameter and with a tensile strength of 551 tons, and two lower stabilizing cables, 2¼ in .in wiameter with a tensile strength of 385 tons.

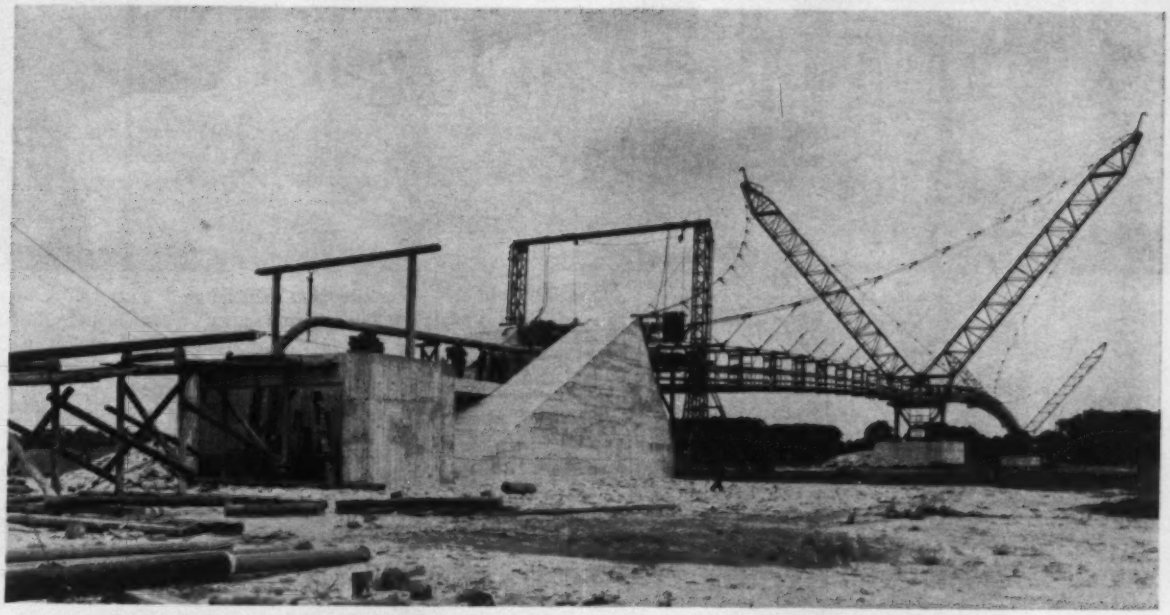
Where the main cables cross the pylon arms they are 173 ft apart. As they drape towards the center of the span, they are brought to within 8½ ft of each other by means of transverse cables attached between them at 27 ft 7 in. intervals.

The suspender cables are hung at this same interval. These cables are brought inward from the main cables at angles varying with their relative positions on the main cables, to connect with the top of the rectangular brackets, that carry the pipes.

The brackets contain horizontal members spaced at predetermined intervals to support pipes of various diameters. Each of these members is equipped with rollers that serve two purposes: they permit the pipes to be threaded through the brackets during construction; and within the completed structure, they allow for longitudinal movement of the pipes occasioned by expansion and contraction.

The pipes, which vary in diameter from 4½ in. to 12¾ in., carry a variety of petroleum products on a two way trip across the river. Crude oil and natural gas are piped southward from the northeastern Austrian oil fields to the Schwechat refinery south of the river; finished products—as fuel oil, lube oils and gasoline—are returned northward across the bridge to the tank farm at Lobau.

The oils, both crude and refined, are kept fluid by superheated steam generated at the refinery and run across the



Cable anchor blocks protect pipes coming from ground to cross bridge.

Y-Shaped Towers

bridge through an 8-in. pipe. The steam pipe, along with the oil pipes, is insulated with a 2-in.-thick layer of glass wool and weatherproofed with aluminum foil.

Three pipes bring the crude in. One has a nominal diameter of 12 in. (12¾-in. OD), two have a nominal diameter of 10 in. (10¾-in. OD). The natural gas line is 4 in. For the return trip there are eight pipes. Gasoline is carried in three of them—one 4 in., two 6 in. Diesel fuel travels through two —one 6 in., one 8 in. Kerosene and fuel oil each move through an 8-in. pipe while lube oil moves a 6-in. pipe.

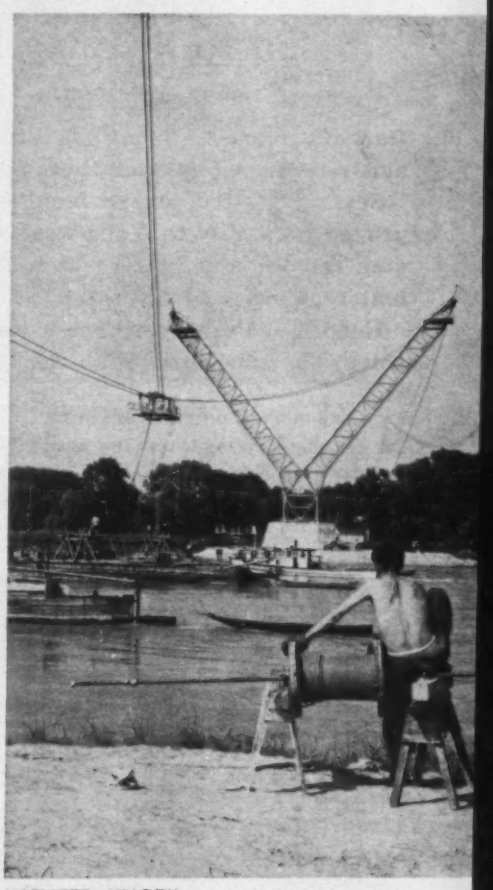
The bridge was erected for Austria's state owned petroleum agency, the Oesterreichische Mineraloel Verwaltung, A. C. at a cost of about $577,000. Its erection took ten months. The towers were prefabricated, delivered in sections to the site, then assembled in ten days by a long-boomed crane.

The pulling and positioning of the six longitudinal cables required another six days. Cable spools were set up near the south anchorage block. Three barges were moved into position between the pylons. A nylon rope was used to pull a small diameter steel cable across the river, and this, in turn, was used to get the main cables across. The cables were not carried from tower to tower, but were pulled across rollers mounted on the decks of the barges. A specially designed friction brake mounted on the south pylon footing kept the cables under tension during the pulling operations to prevent them from being dragged through the water.

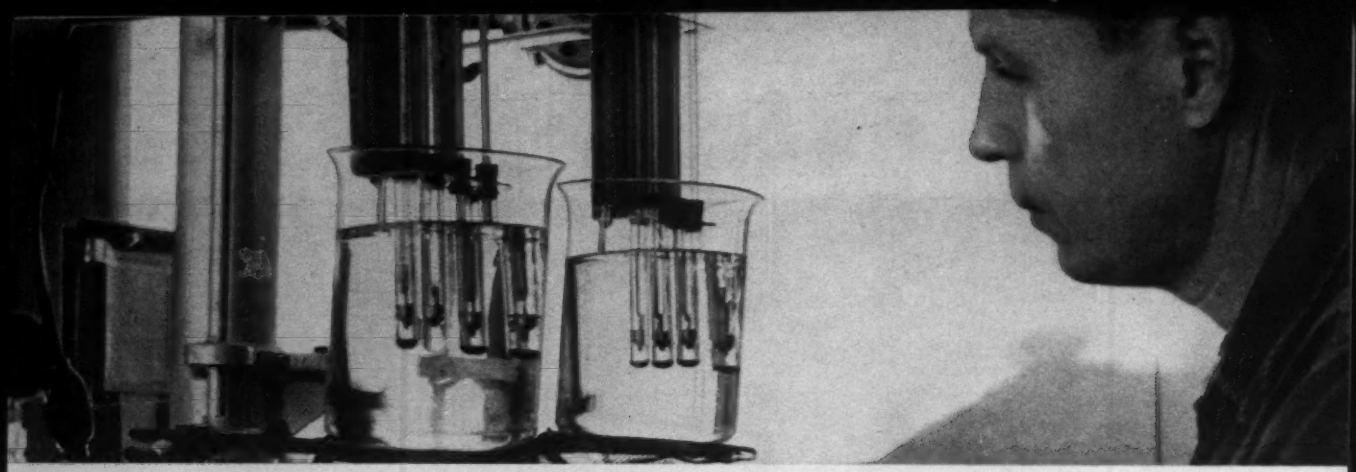
When the cables were stretched from one side of the river to the other, they were lifted into place by means of falls mounted on brackets above the tips of the pylons. The northern end of the cables was affixed to the anchorage first by clevises and 7.81-in.-dia pins. The southern end was then moved into position by 200-ton hydraulic jacks, and pinned.

Anchoring of the main cables was followed by tying the so-called "center knot," one of the principal stabilizing devices in the structure. The "knot" is a fixed but flexible connection at the center of the main span. In it, the twin upper and single lower cables on each side are clamped together and then connected transversally through the top member of the center pipe rack.

Horizontal tie cables and suspenders were then placed by men working from small cars traveling both on the upper and lower main cables. All cables were pre-cut, but the suspender units included turnbuckles that permitted minor adjustments in cable length.



"CENTER KNOT" is formed by connecting the six main cables at mid-span.



Dropping point test shows how greases react to heat. Beaker fluid has been heated to 390° F. All greases tested except Darina (second tube from left) have passed from solid to liquid state.

BULLETIN:

Shell reveals the remarkable new component in Darina Grease AX that helps it last up to 3 times longer than soap-base greases

Darina® Grease AX is made with Microgel*, the new thickening agent developed by Shell Research.

Severely tested for 18 months, Darina AX with Microgel proved its ability to resist washout, even in mud and slush—stay smooth and buttery at high temperatures—and reduce maintenance.

Read how this superior new multi-purpose grease can help solve your lubricating problems.

THERE IS no soap in Darina Grease AX. No soap to melt away—wash away—or dissolve away.

Instead of soap, Darina AX uses Microgel—a development of Shell Research.

What Microgel does

Because of Microgel, Darina AX has no melting point. It won't run out of bearings.

Even compared to soap-base greases, Darina AX provides significantly greater protection under adverse service conditions.

Resists washout

Mix water into Darina AX and the grease maintains its consistency. It shrugs off water—won't emulsify. For fleets that must operate in snow, slush, rain or mud—Darina AX is an ideal choice.

Longer lubrication life

Shell scientists tested Darina AX, under wet conditions, in a special device called an Oscillating Friction Machine.

Darina AX kept its lubricating qualities twice as long as a premium soda soap-base grease; 2½ times longer than a calcium-soap grease; 3 times longer than an aluminum-soap grease.

Results of field test

In a recent field test, 15 firms used Darina AX in chassis and wheel bearings of over 1000 vehicles. These buses, trucks and vans rolled up 30,097,000 chassis miles. The results:

1. Every company was pleased with the performance of Darina AX.
2. There wasn't one wheel bearing failure due to grease deficiency.
3. In many cases, re-lubrication schedules could be extended.

For details, see your Shell Representative. Or write: Shell Oil Company, 50 W. 50th St., N. Y. 20, N. Y.

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SHELL

A BULLETIN FROM SHELL
—where 1,997 scientists are helping to provide better products for industry

Plastic Plugs Pipeline Cracks

Epoxy and polysulfide crack fillers saved half the cost of 13 miles of new concrete pipe for a northern California irrigation system.

The pipe was cast monolithically in the spring and summer of 1959 for the Solano Irrigation District near Vacaville. Extensive longitudinal and circumferential cracks were noted less than a year later—so extensive that at no point in the 13 miles was there a continuous length of 150 ft without cracking of some sort. An explanation of the cracking is still being sought.

The compounds and methods were picked after consideration of many repair materials and techniques—including complete replacement of the pipe. Most of the work was accomplished during the 1959-60 slack irrigation period.

The repair job included 32,000 ft of 30-in. pipe, 11,000 ft of 36-in. pipe and 37,000 ft of 42-in. pipe. Cost of the work was something under $4 per lin ft. This is expensive, but it would have cost twice as much to replace the pipeline and it would have seriously interrupted water service.

The compounds used are expected to be far more effective and permanent than simple mortar repairs.

Crack direction determined the filler material. Longitudinal cracks were repaired with an epoxy compound that forms a hard permanent surface and is actually stronger than the original concrete. Circumferential cracks were repaired with a polysulfide compound with a high bonding strength and enough resiliency to let the pipeline move. Movement might be caused by pump vibration, soil shifts or expansion and contraction with water-temperature changes.

Both materials were formulated by the Chem Seal Corp. of America with headquarters in Los Angeles.

The irrigation district developed an air-pressure gun for applying the compounds. The barrel is a 4-in. steel pipe about 18 in. long with an application tip on one end, a compressed-air inlet at the other, and a gasketed piston to expel the compound. Portable cylinders supply the air. The material was mixed in 1-gal power mixers and the guns were loaded outside the pipeline. The epoxy compound was workable for ¾ to 1¼ hours before setting, the polysulfide for three hours.

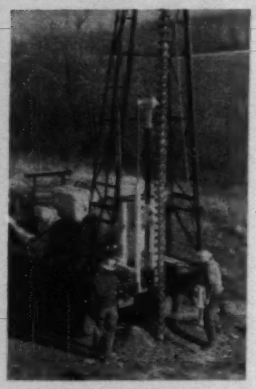
All repair was done from inside the

Cracks up to a half-inch wide in concrete pipe are . . .

Calked by air gun with plastic sealing compounds.

Compounds differ, depending on crack direction.

ACKER DOUBLE-DUTY RIG
FOR AUGER BORING OR CORE DRILLING!



Acker SP handles 5 foot hollow-stem or conventional auger flights. Switches to roller rock, carbide, saw tooth or diamond bit coring. The SP handles angle or vertical holes, deep or shallow in any formation.

Core drilling or augering problems anyone? Just name it—the Acker SP will tame it! It's rugged and versatile . . . switches from core boring to augering. It has muscle to auger 300 feet or core to 1500!

Acker's SP is designed for heavy duty service. It has a four speed cathead hoist, built-in reverse and four speed transmission. It's completely self-contained and mounts on truck. Owners of the SP are reporting unprecedented results drilling and augering for soil samples, in hollow stem augering and geophysical and geological exploration.

For more information write for Bulletin 31-ST or have us demonstrate the versatility of this advanced rig. There's no obligation!

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in all voltages—DC 6 to 220 v. AC 6 to 250 v.
in sizes from 3" to 12"

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pipe. Workmen rode dollies in the smaller lines.

Cracks were dug free of mud, then buffed and air jetted before repair. Sand blasting and chipping were tried but abandoned. The repair materials were gunned into the cracks as far as possible. Then they were buttered in and bladed off with hand tools. The finished surface was not completely smooth but not rough enough to hinder flow seriously.

The repair work was effective but not 100% successful. Some additional cracking is now being repaired by the same methods. In most new deterioration, the old cracks have not opened completely, but parallel cracks have developed. At some places they run into and out of the previously repaired cracks.

Solano Irrigation District forces are doing the work under the direction of J. E. Wiggins, secretary-manager. Ernest C. Fortier of Fresno, Calif., served as consulting engineer to the District during the development of the repair methods.

A High School Campus At $13.56 Per Sq Ft

A high school consisting of eight separate buildings instead of a conventional classroom block with gymnasium wings will cost only $13.56 per sq ft to build.

Total cost of the campus-style school, under construction in Holland, Mich., is $2.5 million. Completion is scheduled for spring 1962.

Key to the low cost is the design of two classroom buildings, each housing 600 students. The two circular wings of each unit contain seven classrooms each. These rooms border a central nucleus for seminars, large assemblies and meetings. Flexible partitions permit variation of room sizes.

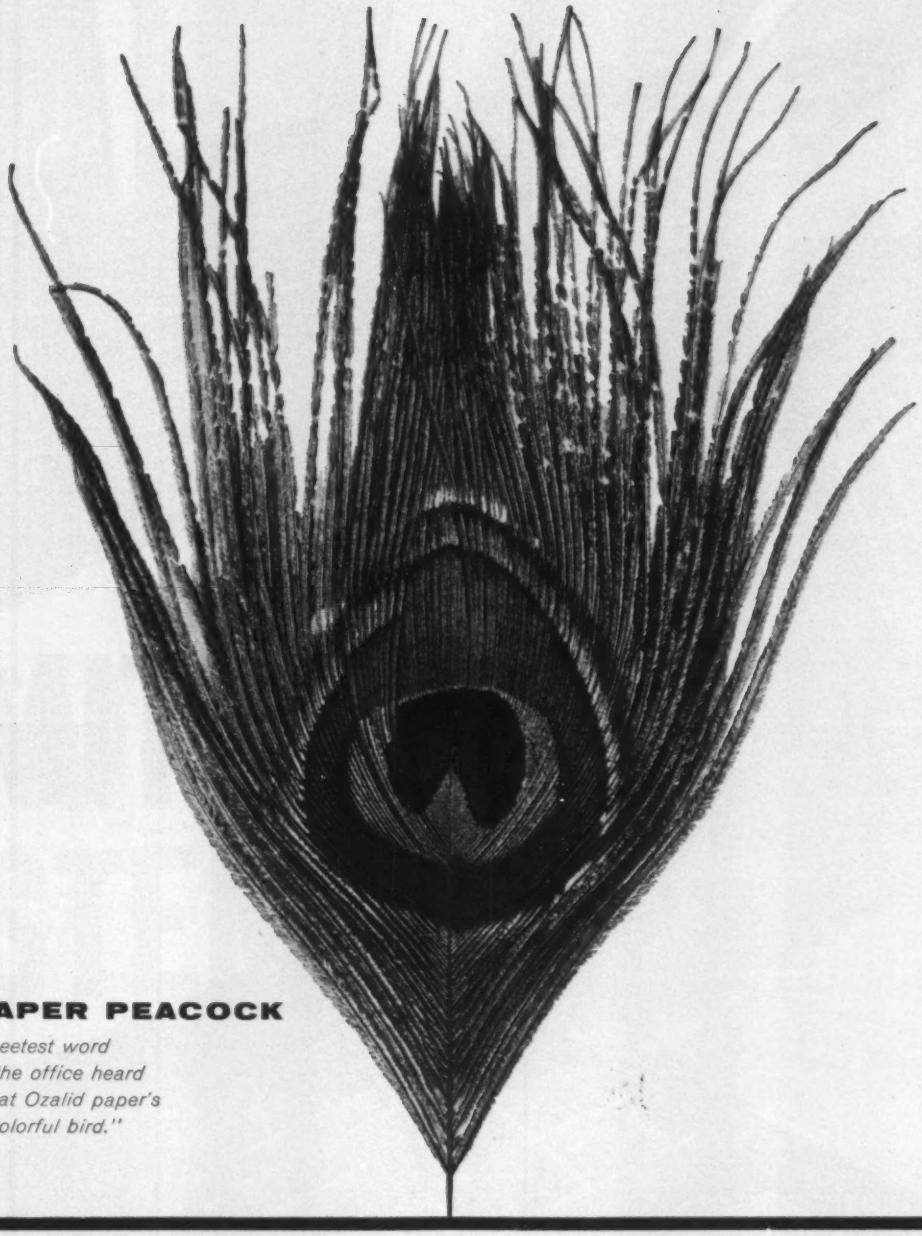
A circular field house has a 180-ft-dia laminated wood dome roof. Designed primarily for student athletics, it will also seat 2,400 spectators at indoor sports events.

A separate building, removed from the campus center, houses the heating plant.

All buildings except the field house have air conditioning.

Structural framing materials are structural steel and laminated wood. Roof deck is wood-fiber concrete plank. Exterior walls are precast concrete and porcelainized aluminum.

Architect is Suren Pilifian; structural engineers Richard H. McClurg & Associates, both firms from Detroit. General contractor is Elzinga-Volkers, Inc., of Holland, Mich.



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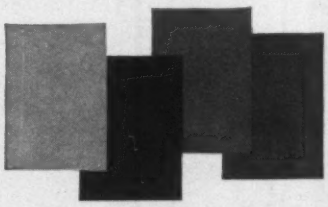

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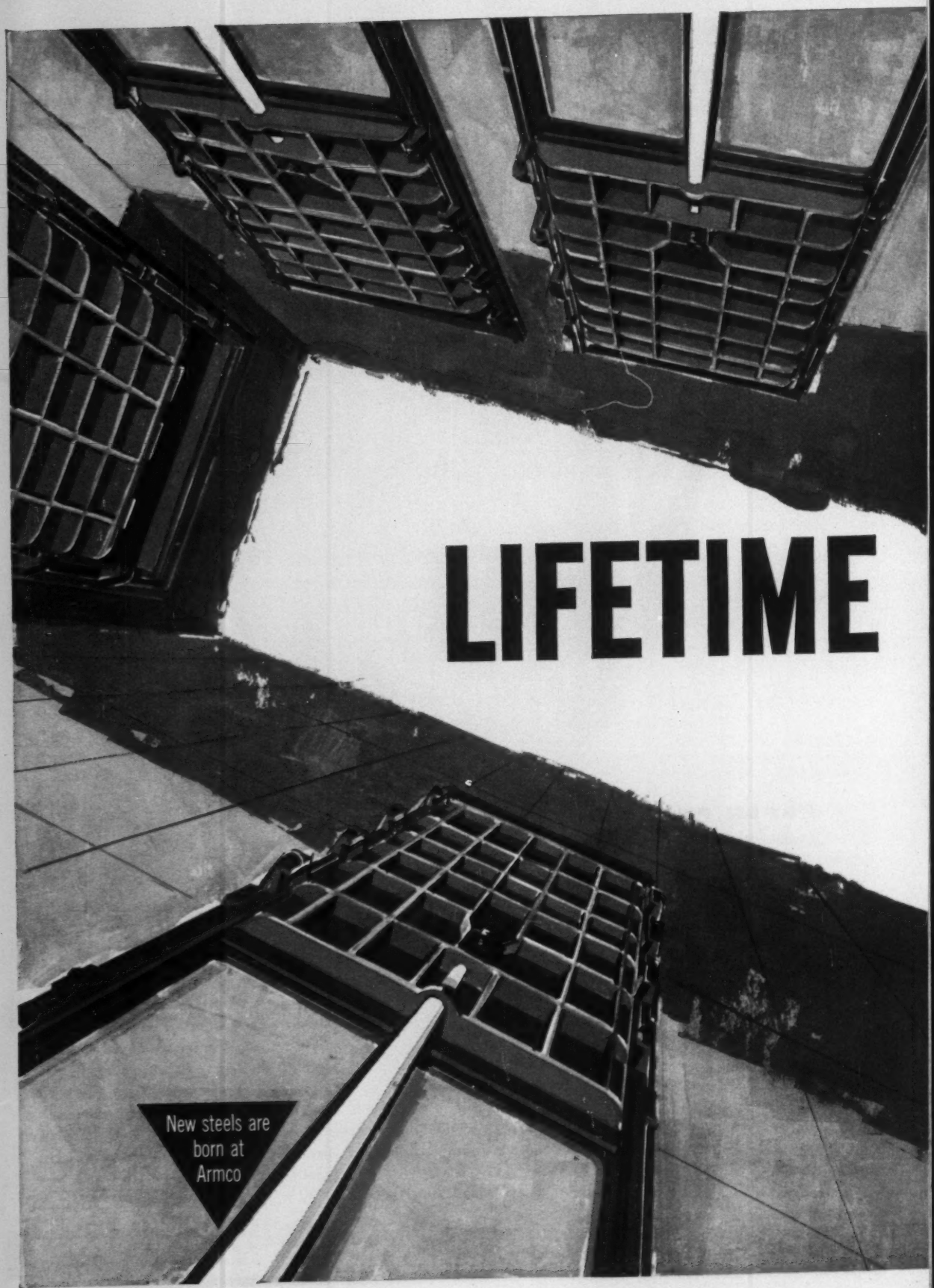
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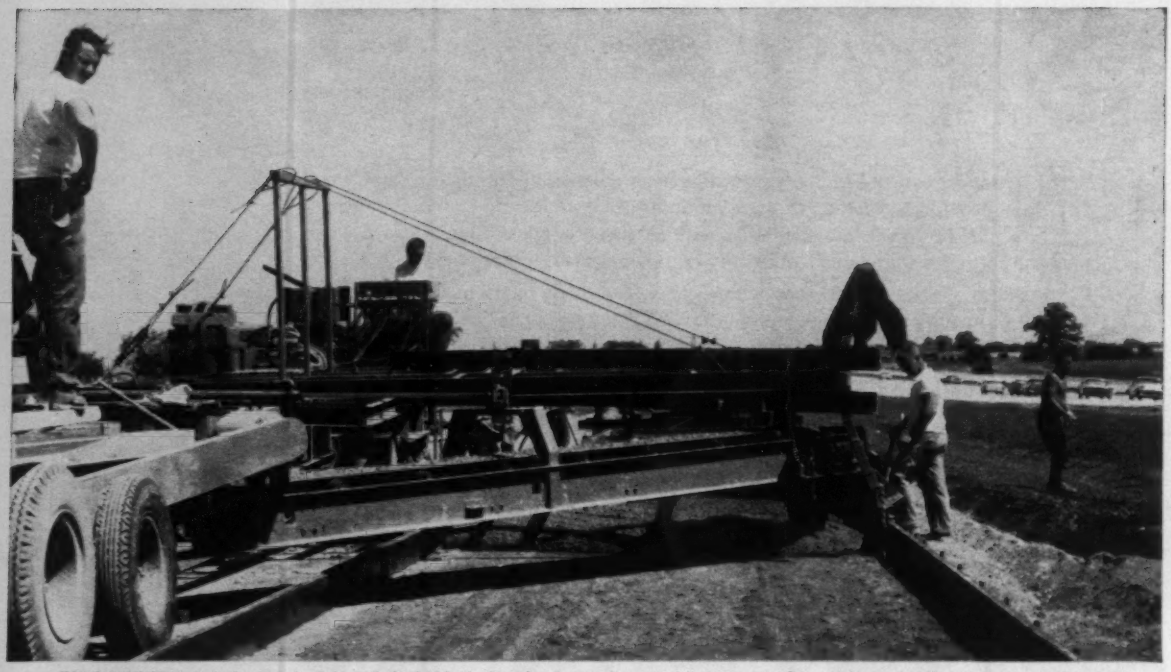


TRUCK MIXERS chuted concrete onto 30" pivoted belt of contractor-built spreader. Rig spread the batch across 12' lane and struck off base and top courses. On one day, crew placed nearly a mile of 10" slab. Contractor: F. F. Mengel Co., Inc., Wisconsin Rapids, Wisc.

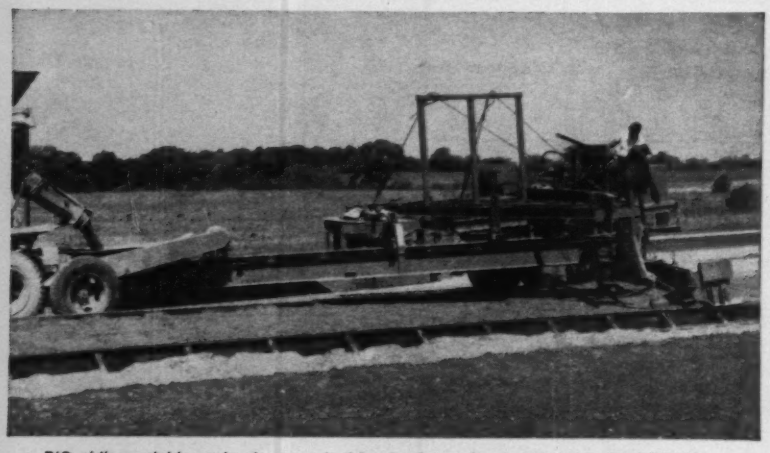
Truck mixers maintain fast paving pace on 10.8 mile job

Eleven 6-yd. truck mixers fed a steady flow of concrete to pave 10.8 miles of 4-lane divided highway on Interstate 94 in Wisconsin. A portable plant, set up on a "split-level" design in an adjoining area, batched up to 220 cu. yds. per hour to maintain a fast daily average of 4,000' of 12' x 10" reinforced slab.

Three 40-yd. aggregate bins were placed on high ground with the cement bin on a lower level, to keep ramps low. Aggregate was belt-fed to a central batcher and then, by portable conveyor, to the truck mixers. Cement and water from a separate batcher were introduced at this same point. An automatic sprayer inside each mixer washed in the cement and aggregate and later washed down the drums. The 5 gallons of water used for each spraying were compensated for in the 6 yd. batch.

A contractor-built spreader, pushing the truck mixers ahead, received and spread the concrete by transverse belt, and struck off in two courses. A transverse finisher, followed by a combination finisher and pan float, and a spray machine, completed the train.

The daily average of 1,500 cu. yds. of specification concrete was produced by truck mixers of certified design, capacity, mixing speed and water control accuracy.



RIG, riding outside paving lane, pushed truck mixers ahead of it. Job-built strike-off bar was dragged by T-section boom, which also carried swinging end of conveyor.

6 CUBIC YARD
MIXER
MAXIMUM CAPACITY
CERTIFIED BY THE TRUCK MIXER MANUFACTURERS BUREAU TO COMPLY WITH ITS STANDARDS FOR TRUCK MIXERS AND AGITATORS AS APPROVED BY THE N.R.M.C.A.
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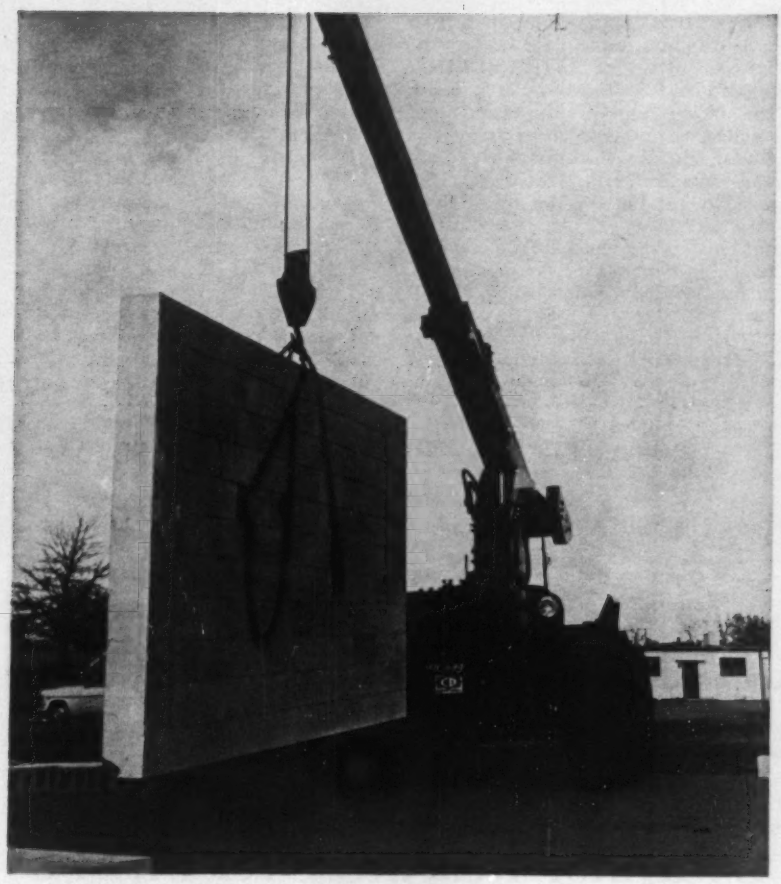
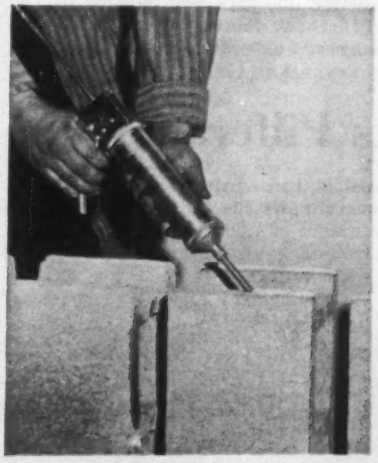


Masonry panel lifted by crane shows how . . .

New Mortar Strengthens Walls



MASON with caulking gun applies new mortar in ⅜-in. beads.

Stronger walls, built faster and cheaper with a new mortar made from organic and inorganic binders, may mark a new era in masonry construction.

Raybestos-Manhattan, Inc., the manufacturer, hopefully makes these predictions:

- It will stimulate new business through 30% reduction in masonry costs.
- It will promote new forms in masonry through its great strength.

Called THREADLINE, the new mortar will bond all common kinds of masonry, if the units are preground for proper surface alignment and angularity to accommodate the narrow joints. Finished joints with THREADLINE are ⅛ in. or less. They are made by pressing the units hard against one another.

Specific advantages claimed for the new mortar include:

- Savings in labor costs up to 50%.
- Time savings up to 50%.
- Faster attainment of full mortar strength.
- Proper setting in lower temperatures than ordinary mortar.
- Improved wall appearance.

The mason can mix a gallon of THREADLINE (enough to bond 100 concrete blocks) in five minutes, using an electric mixer. He applies the mortar in a ⅜-in. bead on the face of the units, using a common caulking gun or compressor-powered extruder.

Placed about ¾ in. inside the exposed face of the masonry, the mortar bead flattens to a joint ⅛ in. or less in thickness and 1 in. or more in width. No tooling of joints is required if the beads are properly applied. The thin joints also help to ease the job of maintaining level courses. The mason can lay several courses atop a leveled course before he has to string another leveling line.

Special units of larger dimension than ordinary blocks are required to maintain an 8-in. module. Ordinary units, ground to suit the geometric tolerances imposed by THREADLINE, are also used.

Over-all cost savings in THREADLINE-bonded walls come entirely from labor cost savings, for material costs actually increase slightly. THREADLINE costs about twice as much as conventional mortar and the preground masonry units cost about 10% more than ordinary units. Halving the labor costs, which usually total about 70% of the wall costs, results in the 30% over-all cost saving claimed by Raybestos-Manhattan.

A test devised to compare erection time showed the THREADLINE wall built in less than one-third the time required by masons working with ordinary mortar. Three masons worked on each of two walls five courses high and 14 courses long. All mortar was mixed before the test started. The masons using THREADLINE completed laying the block and cleaning up in 11 minutes; their competitors using conventional mortar required 37 minutes to lay the block, point up joints and clean up.

Laboratory tests have produced the following results:

- Compressive strength of 50,000 psi, attained within four days between 50 and 80 deg F.
- Bond strength five times that of Type N (ASTM Designation C270) mortar.
- Tensile and shear strengths also exceeding the strengths of Type N mortar.

(Please turn the page)

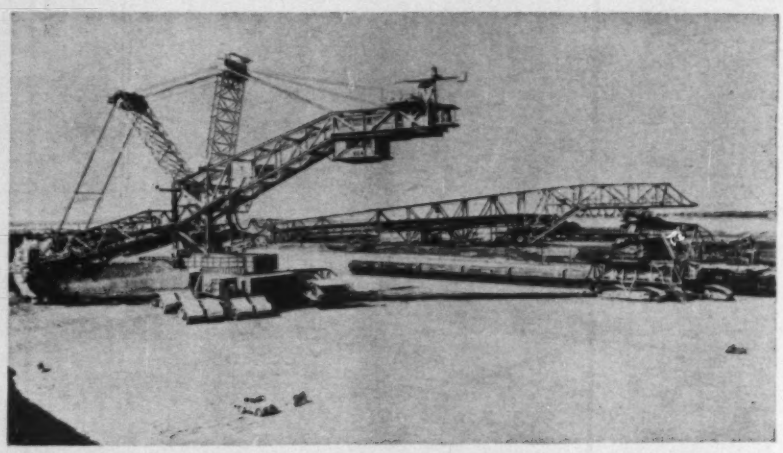
• Successful performance in a 100-cycle free-thaw test.

Lead tests of THREADLINE-bonded block walls resulted in failure of the block, whereas the same load resulted in mortar failure with Type N mortar. An 8-in.-thick, 22-ft-long block wall bonded with THREADLINE failed in the block under the pressure of a 6½-ft water head. The joints of a similar wall, bonded with cement-sand-lime mortar with steel reinforcing in the horizontal joints, failed at 4½-ft head.

The new mortar's great strength also adapts masonry to some unusual forms and to rougher handling than conventionally bonded walls can take. A 4-ft-dia wheel made of manhole block was built, lifted by crane and transported to another site without suffering any damage.

A concrete block panel, 20 ft long and 7 ft high, was lifted by crane and carried unharmed to another location. A similar wall, built with ordinary mortar, disintegrated when the crane lifted it, reports Raybestos-Manhattan.

Further tests (fire furnace, hose stream, etc.) are presently under way. Raybestos-Manhattan, Inc., Adhesive Dept. T, Bridgeport 2, Conn.



Excavator Reaches Over 500 Ft

This excavator has an arm length of 525 ft and is 150 ft high. With its 46-ft bucket wheel the 3,000 ton machine can excavate at the rate of 4,900 cu yd per hour.

Despite these dimensions the excavator shown is just a medium size member of the line of West German excavating, reclaiming and stacking equipment that is being built by Demag-Lauchhammer of Dusseldorf.

Largest models will handle up to 20,000 cu ft per hour.

U. S. sales and manufacturing rights for the line have been granted to The Wellman Engineering Co., an affiliate of Mcdowell Co., Inc., Cleveland, Ohio.

Door Control Cuts Pilferage

A panic bar release and a low-voltage alarm system combined in an emergency door lock help eliminate pilferage from material and parts depots. While the panic bar release provides for gate or door opening as required by fire and safety regulations, a high pitched alarm sounds off to signal each time the exit is used.

The Safety Alarm Lock includes a heavy deadbolt with 1-in. throw to keep the exit securely—and legally—locked day and night. When the panic bar is depressed, the bolt springs back automatically and a loud alarm goes off, signalling an unauthorized exit. The makers says the alarm is audible at a distance of 1,000 ft.

Key-carrying personnel can stop the alarm quickly and reset the lock, or bypass the alarm for authorized passage through the exit.

For central control in large plants, the lock may be wired to a central control panel.

Microswitches are standard in all locks for wiring this type of central system. Door Controls, Inc., 2066 Hillside Ave., New Hyde Park, N. Y.

(*New Products continued p. 55*)

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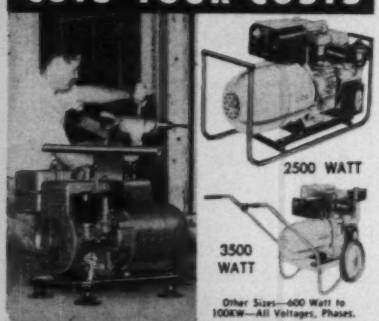

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WINPOWER MFG. CO.
Dept. ENR NEWTON, IOWA

Breaking stone out of solid bank was Michigan's chore when rain-soaked shot failed to shatter basalt ledge. Rugged machine withstood test with no loss in production.

Big rubber-tired Tractor Shovel economically excavates and hauls shot rock

Output, 3600 tons daily on 600 ft cycle, enables Idaho contractor's one Michigan to replace "standard" shovel-truck fleet

The 4½ yd Michigan Model 275A Tractor Shovel you see here is, by itself, doing all excavating and hauling of shot rock on a highway re-location job in northwestern Idaho.

Its production on 300 ft one-way hauls, bank to portable crusher, averages 3,600 tons per 20-hour day, *excavated and hauled*. Contractor, Grant Construction Company, Coeur D'Alene,

Michigan runs up 18 percent, 25-ft incline to charge crusher with 180 tons of stone per hour.

is thus saving the costs of the 1¾ yd rock shovel and two six-yard rear dump hauling units normally used on such a project.

Breaks out rock from poorly shot bank

"Our first test with the Michigan was sure a rugged one," recalls Company President Jay Grant. "We had been using the machine to load crushed stone on another job. Never thought of trying it on this project (a $613,000, 5.3 mi relocation of U.S. 95 near Lewiston, Idaho). Then our Michigan Distributor (Western Machinery Co, Spokane) told us how other rubber-tired Michigans had been cutting costs on shot rock applications in other locations. So we brought it in, figuring it would dig and load most efficiently in rock shot to 12-inch size. We drilled the basalt shelf accordingly. However, rain hit us before we could detonate the dynamite charge . . . and the shot gave us uneven breakage *with most of the basalt remaining in the bank.*

"But that didn't stop our Michigan! It moved into the bank . . . and pried out the solid rock (weighing in-the-bank, 4900 lbs/yd) as if it were loose material. The way the Michigan handled that job was the 'acid test' as far as we were concerned. For one thing, it sure convinced us we wouldn't need the rock shovel. We were right . . . today the Michigan is charging the crusher at a steady rate of 180 tons per hour, 20 hours per day . . . *and there have been no delays due to downtime.*"

Of all Tractor Shovels, only the Michigan is built to withstand such abuse. It'll do the same kind of job for you. Best way to find out is to ask your Michigan Distributor for a no-obligation demonstration—nine models available with buckets from 16 cu ft to 6 cu yds. Also four models of Tractor Dozers—162 to 600 hp . . . and a full line of Tractor Scrapers—12½ to 32 cu yds. Same rugged construction throughout all Michigan machines.

Michigan is a registered trademark of

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New Product Briefs

• **Airless pump**—A lightweight airless pump will handle all conventional paints with a standard airless gun fitted with medium production caps. The 17-lb, 5-gal capacity pump has a 26:1 ratio and will operate with air from a 1-hp compressor. Price is $192.50 fob Toledo. THE DEVILBISS CO., TOLEDO, OHIO.

• **Concrete placer**—Un-Creter, a pneumatic concrete-placing machine is capable of wet spraying, concrete placing by hose and high- and low-pressure grouting. The 2,200-lb. machine will pump up to 20 cu yd per hr and hoist materials up to 10 stories high and 300 ft. horizontally with power from its 56-hp engine. AIR PLACEMENT EQUIPMENT CO. 1000 WEST 25TH ST., KANSAS CITY, MO.

• **Power protector**—All contacts open when any single fuse blows, and blown fuse indicator automatically pops out on the LB-1 power protector. Contacts are reclosed by four cam-released springs only after the fuse has been replaced and the indicator reset. The protector has a 200,000-amp interrupting capacity and is rated up to 480 v for ac, 800 to 4,000 amp continuous. GENERAL ELECTRIC CO. SCHENECTADY, N. Y.

• **Fork trucks**—CFY-60, CFY-70, CFY-80, trucks with 6,000, 7,000 and 8,000 lb. capacities have fully-synchronized friction clutch transmissions that permit them to be shifted from forward to reverse without stopping. A 74 hp engine drives the trucks, which also feature hydraulic disk brakes enclosed within the drive-axle housing. INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT CO., BATTLE CREEK, MICH.

• **Portable core drill**—For coring holes in concrete, reinforced masonry and tile or glass, the Acker Ambassador has heavy duty, high torque, two-speed reversible electric motor. Stand has two wheels for transporting rig. Drill feed is rack and pinion. ACKER DRILL CO., INC. P. O. BOX 830, SCRANTON 2, PA.

• **High-heat paint**—Clear silicone base blended with a special aluminum pigment gives C-I Extra High paints ability to withstand temperatures up to 1,700 deg. The paint, offered in 10 colors, air dries in 30 minutes to form a metal coating that resists moisture, corrosion and industrial fumes. CHEM INDUSTRIAL CO., 3784 RIDGE ROAD, BROOKLYN 9, OHIO.

• **Guaranteed panel**—A fiberglass-reinforced plastic panel comes with a 20 year guarantee to retain uniform surface conditions. The Stylux-20 formula protects the panel's color and light transmission characteristics, BUTLER MANUFACTURING CO., 7400 EAST 13TH ST., KANSAS CITY 26, MO.

• **Corrugated steel**—Ridgi-Cal is a porcelain enameled corrugated-steel material designed for roofing, siding and other architectural uses. It is available in standard sizes in a variety of profiles and gauges. CALORIC APPLIANCE CORP., TOPTON, PA.

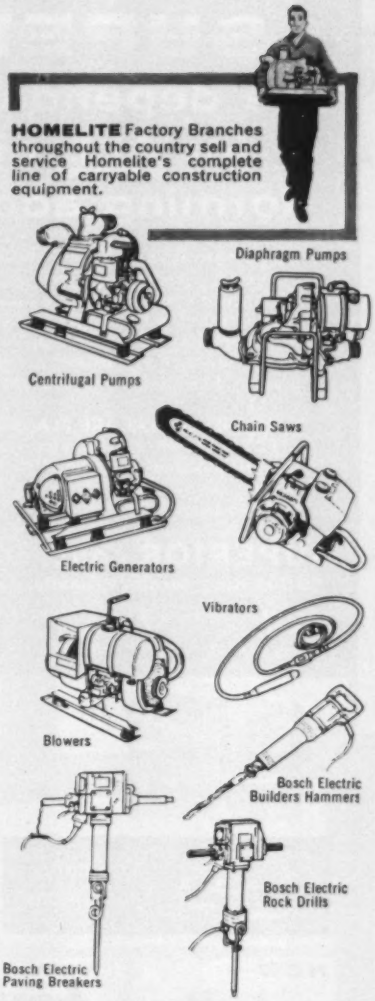
• **New C-clamp**—A threadless clamp made of high tensile strength aluminum alloy is available with anvil or vee spindles in 2-, 4-, and 6-in. sizes. It features quick operation, says the manufacturers. UNITED ASSOCIATES, 1605 N. HERCULES, CLEARWATER, FLA.

• **Epoxy resin compound**—Epo Liquid plastic, an epoxy resin compound, is designed for complete water proofing and protection from corrosion. It can be applied to most masonry walls and partitions in a thickness up to ¼ in., and comes in a variety of colors. GEORGE E. FINES, INC., 18640 WYOMING AVE., DETROIT 21, MICH.

• **Weatherstripped lock**—A silicone-treated wool pile weatherstripping, permanently attached to the outer edge of the lock faceplate, provides a continuation of weatherstripping usually broken by ordinary lock mechanisms. It provides additional protection against the entry of air, dust and rain into the lock mechanism. SCHLEGEL MFG. CO., 365 EAST AVE., ROCHESTER 4, N. Y.

• **Plastic insulation**—Foamthane, a polyurethane foam, has about twice the insulating value of an equal thickness of polystyrene foam, according to the manufacturer. Made in rigid panels up to 2 ft wide and 6 ft long, Foamthane is designed to insulate walls and ceilings for a temperature range from −330 deg F to +200 deg F. PITTSBURGH CORNING CORP., ONE GATEWAY CENTER, PITTSBURGH 22, PA.

• **Gas line filter**—Designed to eliminate dirt and scale from natural gas lines, a gas line filter is available in two sizes, ¾ in. and 1 in. diameter. Filter element is easily removed for cleaning. Maximum safe pressure is 125 psi. ROCKWELL STANDARD CORP. 25000 MILES ROAD, CLEVELAND 28, OHIO.



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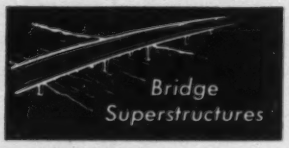

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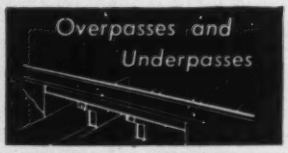
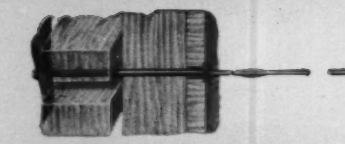
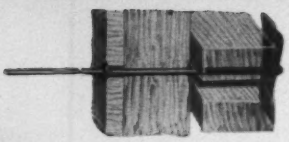
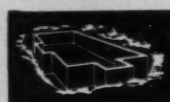
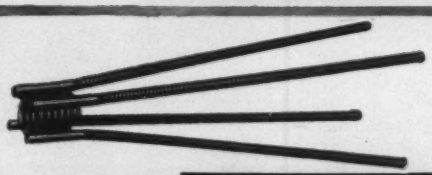








SNAP TIES



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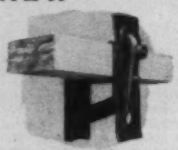

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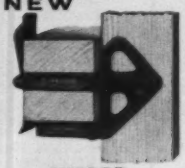
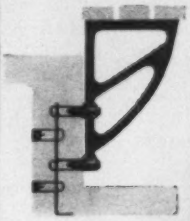


WALER BRACKET

NEW

SCAFFOLD BRACKET



RISERFRAMES

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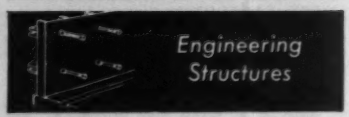
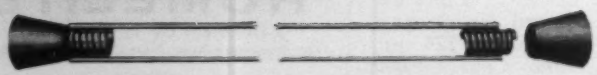
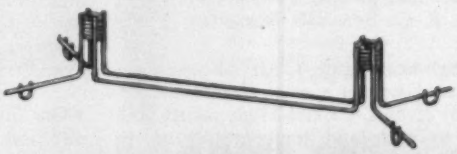


COIL TIES





PICK-UP INSERTS

Highway Prices—District of Columbia

Average Contract Prices 2nd Half—1960

Bid Awards, 1960—2nd Half

Roadways

Items	Unit	No. Jobs	Avg.	Range Unit Prices
Excavation, ordinary	cy	5	$1.78	$1.00– 3.00
hard surface	cy	4	3.20	2.50– 4.00
hand	cy	2	11.50	8.00– 15.00
Borrow for embankments	cy	2	3.90	3.80– 4.00
subbase	cy	2	3.90	3.80– 4.00
soils base	cy	4	4.63	4.00– 5.25
Soils base crse	cy	1	5.00	5.00
8"	sy	1	0.90	0.90
Interceptor drains 6"	lf	1	2.00	2.00
8"	lf	1	4.50	4.50
Excavation trench, add	cy	2	7.50	7.00– 8.00
Pipe, connecting 6"	lf	1	2.00	2.00
8"	lf	1	5.00	5.00
Borrow for trench bf	cy	2	5.00	4.00– 4.00
Lumber, lip	Mbf	1	100.00	100.00
PCC pvt, reinf	cy	2	25.00	18.00– 32.00
8"	sy	1	6.90	6.90
Wire fabric reinf #50	sy	5	0.65	0.50– 0.75
Expansion joint filler	lf	2	0.90	0.80– 1.00
Cmt, std add	bbl	4	5.50	5.50– 5.50
Calcium chlor accel	lb	3	0.03	0.03
PCC base, reinf	cy	3	36.15	32.00– 42.50
8"	sy	1	7.00	7.00
drwy & alley ent 7"	sy	4	8.05	7.00– 9.00
sidewalks	sy	5	5.70	4.50– 6.50
repairs	sy	4	6.30	5.40– 6.95
curb "A", 18"	lf	3	2.53	2.20– 5.00
Expansion joint filler				
alleys	lf	3	0.82	0.60– 1.25
sidewalks	lf	5	0.72	0.60– 1.00
PCC curb variable	cy	5	70.92	65.00– 74.80
comb curb & gutter "A"	lf	3	3.75	3.50 4.25
gutter	sy	2	10.00	8.00– 12.00
islands, cl B	cy	3	34.66	29.50– 45.00
busstops, cl A	cy	3	40.33	36.00– 42.50
Sidewalk, brick repairs	sy	3	3.33	3.25– 3.50
Cut to neat line	lf	4	1.07	0.80– 1.25
Anchor bolts	ea	2	3.25	3.00– 3.50
Curb set clr stone 8"x12"	lf	5	3.24	1.60– 4.40
reset 8"x12", 8"x8", 6"x20", st or clr	lf	6	3.63	1.20– 6.00
PCC alley reinf 7"	sy	1	8.25	8.25
MH adj, frames & basin cover	ea	4	14.25	12.00– 15.00
Vlv water, adj, frame casing	ea	3	20.00	15.00– 30.00
PUC MH frames, adj				
less than 6 sf	ea	2	1.00	1.00– 1.00
6–15 sf	ea	2	1.25	1.00– 1.50
over 15 sf	ea	1	15.00	15.00
Asph conc binder mod	t	5	18.31	8.88– 24.00
sht surface	t	5	18.88	10.39– 22.00
conc base cl A	t	3	14.60	14.00– 15.00
surface cl C	t	3	18.83	15.00– 23.90
D	t	2	11.90	8.80– 15.00
PCC pvt repair	cy	2	42.80	42.80– 42.80
Asph surface repair by heat method	t	4	25.42	23.00– 29.00
Waterproofing,membrane	sy	1	0.50	0.50
PCC wall-step coping, cl B	cy	2	85.00	70.00–100.00
Sod-sodding incl topsoil	sy	2	1.31	1.01– 6.25
MH, sew or water, furn frames & covers	ea	1	90.00	90.00
PCC curb clr reinf	lf	1	3.50	3.50
& gutter clr reinf	lf	3	4.43	4.40– 4.50
Cmt conc clr curb for drwy & alley corners	lf	2	4.50	3.00– 6.00
Steel reinf, for steps	lb	1	0.40	0.40

Bridges

Items	Unit	No. Jobs	Avg.	Range Unit Prices
Excavation, unclassified	cy	4	1.18	0.95– 1.35
structure	cy	5	5.84	1.50– 12.00
Backfill and fill	cy	5	2.81	2.50– 3.50
porous	cy	4	9.37	7.00– 12.00
Dampproofing	sy	4	1.11	0.95– 1.00
Waterproofing,membrane	sy	4	3.57	3.00– 4.00
Conc cl BB,				
subfoundation	cy	4	32.87	30.00– 41.50
footing	cy	2	39.75	34.50– 45.00
substructure	cy	3	55.66	40.00– 67.00
superstructure	cy	5	66.55	55.00– 79.75
approach slab	cy	3	36.33	26.00– 44.00
Steel, reinf	lb	5	0.13	0.12– 0.16
structural carbon	lb	5	0.1928	0.14– 0.25
Piles, conc, cip	lf	1	6.50	6.50
Facing, stone masonry	cy	3	10.00	7.00– 15.00
Aluminum railing, hand	lf	4	11.05	7.20– 16.00
Steel railing, hand	lf	1	15.00	15.00
Steel H, piles in place	lf	2	8.12	5.25– 11.00

Sewers

Items	Unit	No. Jobs	Avg.	Range Unit Prices
Excavation, unclassified	cy	1	2.75	2.75
Masonry, brick	cy	1	125.00	125.00
RCSP, 30"	lf	1	20.00	20.00
24"	lf	1	17.00	17.00
21"	lf	1	8.00	8.00
18"	lf	2	11.25	6.50– 16.00
15"	lf	2	8.75	5.50 12.00
Basins, elongated #2	ea	1	470.00	470.00
#1	ea	1	400.00	400.00
standard	ea	2	462.50	375.00–550.00
Gravel, subgrade	t	1	8.00	8.00

See also ENR—November 3, 1960 for District of Columbia Highway Prices for 1960—1st half

St. Louis Water Main a Tough Excavation Job

Trench excavation in paved streets accounted for the high unit prices bid for excavation on this water main contract for the St. Louis Public Service Board. With a bid well below the other six for 21,000 cu yds of "earth"-excavation, Cape Construction Co., Inc., Cape Girardeau, Mo., was able to take this $765,575 award for increasing the water supply from Compton Hill storage reservoir to the consumption area. Samuel Kraus Co., St. Louis, was second with a bid 13.9% above the low. E. E. Easterday is the engineer for the job.

Bidding just $6.00 a cu yd for trench excavation, Cape Construction Co. was $4.00 under the second lowest cu yd bid of $10.00, and $9.80 under the high. High unit prices reflect the toughness of the excavating job and are in line with conditions that must be met.

The main will be laid under other lines at street crossings, requiring support of all lines, sheeting, bracing, and a lot of hand excavation. The depth of trench at most street crossings will be 14 to 16 ft deep by 4 ft 6 in. wide and across the site of a future state highway the trench will be 26 ft deep. Between crossings the trench will be 9 ft deep. Steel pipe will be encased in reinforced concrete and cement mortar lined.

Wage rates include: common labor, $2.925/hr; carpenters, $3.875; and air compressor operator, $3.45.

The bidding included:

1C	Cape Const. Co., Inc., Cape Girardeau, Mo...	$765,575
2	Samuel Kraus Co., St. Louis, Mo.	889,900
7	J. S. Albarici Const. Co., Inc., St. Louis, Mo.	1,171,765

Bids: 10-4-60 Items	Unit	Quantity	Unit 1C	Prices 2
Exc, earth	cy	21,000	$6.00	$11.70
Pipe, steel, f, lay & line				
36"	lf	4,500	26.00	24.00
42"	lf	9,800	27.50	31.00
Concrete	cy	7,400	25.00	23.00
Steel, reinforcing	lb	135,000	0.17	0.25
Sand fill	cy	8,500	4.25	2.00
Bit pavement	sy	5,500	1.00	1.50
Miscellaneous	ls	job	3,500	3,200

ENR Construction Cost Index (1913=100) 20-cities average—829.58

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By ALONZO DeF. QUINN

Chief Engineer and Vice-President Frederick Snare Corporation

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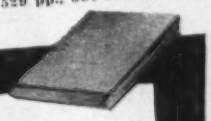

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Materials Prices

Monthly Market Quotations by ENR Field Reporters

See following ENR Issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Mar. 23; Next, Apr. 20.
- Wage Rates Building Board Insulation: Last, Mar. 30; Next, Apr. 27.
- Iron & Steel Products, Pipe: Last, Mar. 16; Next, Apr. 13.

Cement, Aggregate, Ready Mixed Concrete - F. O. B. City

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	†Toronto
Cement, Port., bulk	CL	bbl.	$3.80a	$3.91a	$3.50cf	$4.53ap	$4.02ag	$4.34c	$3.89	$3.46a	$4.39a	$3.91agq	$3.97a	$4.68ch	$4.17a	$3.65b	$4.20a	$4.01fae	$4.62bj	$4.09a	$3.85c	$3.75ag	$3.11def	$3.84t
paper	"	"	4.30af	4.42a	4.43c	5.83ip	4.52ag	4.84c	4.77f	3.93a	4.89a	4.24a	4.52a	5.12ch	4.68a	4.17b	4.71a	4.51fae	5.65bjk	4.59a	4.42c	4.47fa	3.36fde	4.20i
mortar	"	"	3.62af	3.56a	.....	4.90imp	4.15g	4.31c	4.19fae	3.78a	4.89	3.29a	4.30a	5.60c	4.26a	3.97b	3.77a	3.63fe	5.00bjl	4.29a	4.86c	4.65a	3.72fde	4.20i
Gravel, 1½"	"	ton	2.25af	2.80af	2.53ns	3.00qss	3.78fe	2.29fcu	2.25ae	2.55fa	1.95f	2.50fabm	.....	2.56fat	2.70fae	2.61b	.....	1.95fa	2.68faqv	3.40fas	2.02	4.25fbm	1.90fa	2.40
¾"	"	"	2.50af	2.80af	2.53ns	3.00qss	3.78fbe	2.34fcu	2.25ae	2.60fa	2.15f	2.50fabm	.....	2.76fat	2.70fae	2.61b	3.20bk	1.95fa	2.68faqv	3.40fas	2.02	4.25fbm	2.15fa	2.40
Sand	"	"	2.00af	2.25af	2.13ns	3.00qss	4.13fbe	2.44fcu	1.75ae	1.65f	1.42fb	2.16fabm	1.70fa	2.41fat	1.60fae	2.16fb	2.30bkw	1.55fa	3.08faqv	2.40/3.40fas	2.12	4.25fbm	2.40fa	2.05
Crushed stone, 1½"	"	"	3.05a	2.85af	2.75s	1.75qss	3.95fbe	2.55fcu	2.70fy	2.57	.....	2.80fabm	2.10fa	2.41fat	4.00fae	.....	2.85blbb	2.00fa	2.00faqv	1.75js	2.17	4.50fbm	1.90f	2.40
¾"	"	"	3.05s	2.90af	2.75s	1.85qss	3.95fbe	2.74fcu	2.70fy	2.77	3.00fx	2.80fabm	2.10fa	2.46fat	4.00fae	.....	2.85blbb	2.30fa	2.00faqv	1.75js	2.17	4.50fbm	2.15f	2.40
Crushed slag, 1½"	"	"	3.90r	2.05af	1.65d	.....	2.25fe	1.80u	2.30ff	.....	.....	3.15aqaa	.....	.....	.....	1.65d	.....	2.25fa	2.10w	1.55	.....	.....	2.00	2.40
¾"	"	"	3.90r	2.00af	1.75d	.....	2.25fe	1.80u	2.30ff	.....	.....	3.50aqaa	.....	.....	.....	1.75d	.....	2.35fa	2.10w	1.55	.....	.....	2.00	2.40
Concrete block, 8"x8"x16"																								
Sand/gravel	TL	ea	0.19o	0.18a	0.19	0.23o	0.26fe	0.19o	.....	.....	0.25	0.24u	0.22a	0.175f	0.20q	0.25r	0.265nwo	.....	0.22rx	0.26fo	0.24	0.288s	0.20	0.26
Lt. wgt. agg	"	"	0.22o	0.18a	0.19	0.275ao	0.26fbe	0.25ao	0.23f	0.255	0.27ao	.27fau	0.27e	0.25	.....	0.25	0.32bwo	0.20	0.22rx	0.32feo	0.28e1	0.384cs	0.28t	0.30eu
Concrete, ready-mix'r		cy	13.00g	13.50ou	14.75q	15.00q	14.50e	15.00gr	17.25u	11.50x	11.90	15.50eaa	13.50	12.46hlx	14.55f	14.00o	17.60ay	13.90s	16.15o	13.65/14.10q	12.50cw	14.70j	10.80ek	13.75q

f Delivered. * F.o.b. plant. ** Add 4% sales tax ‡‡ Add 2% Intrastate sales tax. R Revised. † Plus 6% Mun & Prov tax.

CEMENT: *a Less 10¢ disc. 15 days. *b Less 2% disc. 15 days. *c Less 10¢ disc. 10 days. *d 10¢ disc. 20 days. *e Truckload lots. *f Fob mill, add $14.58 to $21.31 per car switching charges. *g fob mill + freight. *h LCL. *i Less 2% disc. 10 days. *j Truck lots, fob yard. *k 100 bag lots. *l over 150 sacks. *m Sold in bags only. *n Less 5% disc. 30 days. *o Plus 50¢ for Sat. del. *p 5–8 ton truckload. *q F.o.b. mill *r 50 cy & over *s In bags & bbl. Only. *t min. 7 tons

SAND, GRAVEL, STONE & SLAG: *a Truck lots. *b Per cu. yd. *c 5 tons up. *d Less 5¢ disc. 10 days. *e Less 2% disc. 10th. *f Less 2% disc. 15th. *g Less 5% for cash. *h Less than 5 tons. *j F.o.b. quarry. *k Barge lots asd. *l F.o.b. scow Hudson river. *m Less 2% for cash. *n F.o.b. cars. *o F.o.b. yard. *r less 5% disc. 15th. *s Less 2% disc. 10 days. *t Less 10¢ disc. 10 days. *u Less 5¢ disc. 10 days. *v Less 2% disc. 15 days. *w Less 10¢ disc. 15 days. *x Incl. 35¢ switch charge. *y F.o.b. dock. *z 5–8 tons. *aa Less 5% disc. 15 days. *bb Less 2% 25th of month

CONCRETE BLOCK: *a Cinder *b Waylite. *c Haydite. *d Celocrete. *e 5¼ x 8 x 12 in. *f 8 x 4 x 16 *g F.o.b. truck at job. *l F.o.b. plant San Rafael. *m F.o.b. yard. *n 8 x 8 x 16. *o Less 2% disc. 10 days. *p Less 2% disc. 10th. *q Less 5% disc. 10th. *r Less 2% disc. 15 days. *s Less 2% disc. cash. *t Siporex, 7 x 8 x 16. *u Less 5% disc. 10 days. *v Less 12½ disc. 15th.

READY MIXED CONCRETE: *a 6 cu yd or over del. Man. *b 25 cu yds or more. *c 10-100 cy. *d 1-3 mi. zone add 15¢ for ea. add'l 1-mi. zone. *e 3,000 lb comp. *f 2,500 lb. comp., less 5% disc. 30 days. *g Less 25¢ disc. 15 days. *h Less 50¢ for cash. *i 5% off for cash. *j 2% off for cash. *k Federal tax included. Add 6% mun. & prov. tax. *l 1:2½:3½ base price. *m F.o.b. yard. *n Plus escalator clause. *o Less 2% disc. 15 days. *p Less 50¢ disc. 15 days. *q Less 2% disc. 10 days. Add 50¢ per zone. *r 2000 wgt. *s Less 5% disc. 10 days. *t Incl. 50¢ heating. *u Less 2% disc. 15th. *v Sat. del.+50¢. *w 10-100 cy. *x Del in zone 20-B. *y less 25¢, 10 days. *z less 1% in 30 days. *aa 6 bag mix

MILL PRICES FOR BULK CEMENT: Subject to 10¢ discount, 15 days. For paper bags add 50¢ per bbl., not refundable. *Prices guaranteed through December 31, 1961*

Richard City, Tenn	$3.55	Bath, Pa	$3.50	Northampton, Pa	$3.50	Leeds, Ala	$3.40	Howes Cave, N. Y.	$3.50	Oswego, N. Y.	$3.60	Green Bay, Wis	$3.60
Clinchfield, Ga	3.55	Lesley, Pa	3.50	Universal, Pa	3.60	Duluth, Minn	3.60	Muskegon, Mich	3.55	Cleveland, O	3.65	Ironton, O	3.65
Kingsport, Tenn	3.55	Buffington, Ind	3.55	Waco, Tex. (+ 10 tax)	3.35	Hudson, N. Y.	3.50	Saginaw, Mich	3.60	Alsen, N. Y.	3.50	Montreal, Cana	2.80
West Des Moines, Iowa	3.65	Independence, Kan	3.35	Giant, S. C.	3.55	Alpena, Mich	3.50	Wyandotte, Mich	3.60	Toledo, O	3.60	W. Winfield, Pa	3.61
Nazareth, Pa	3.50	Hannibal, Mo	3.55	Steelton, Minn	3.60	Detroit, Mich	3.60	Buffalo, N. Y.	3.55	Milwaukee, Wis	3.60	Security, Md.	3.50

*a 280 lb. bbl.

Paving Brick, Block, Asphalt, Road Oils - F. O. B. City

Item	Quantity	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
Paving brick, block-																								
Brick, 3"x4"x8½"	CL	M	e	e	e	e	$150.00fab	e	e	e	e	e	e	e	e	e	e	e	$60.00k	e	e	e	e	e
Granite, 4"x4"x8"	q	M	e	e	$66.00i	e	95.00fa	e	89.50	40/80	62.00a	$114.00	e	e	e	e	e	e	95.00n	e	$70.00	e	e	$120.00ff
Wood, 3½" 16 lb		sy	e	e	e	e	3.95/4.00aj	e	6.30	e	e	e	e	e	e	e	$3.70f	e	6.35n	e	e	e	e	4.50f
Asphalt, paving																								
Tank car	CL	ton	$11.82W	$21.00	25.12 O	$22.00apS	22.00b	$24.00SU	26.00tA	26.90	.....	31.50f	$18.75cl	$19.00dmx	23.70	$20.00e	22.90mO	0.22u	31.20isv	$19.74	22.50gdd	$24.00z	$30.50n	38.90
Drummed	CL	gal.	12.20W	.....	25.69	46.00apS	32.00b	.....	.....	46.35	.....	.....	.....	.....	.....	.....	67.83mO	.....	.....	21.65	41.00gdd	47.00h	43.60n	59.01ee
Asph. binders, fluxes																								
Tank car	CL	ton	0.1182W	0.9i	0.1069	22.00avS	20.40bv	24.00ffv	26.00tvA	.1138	.....	32.20f	18.75cv	19.00dvx	23.70	20.00ev	22.90vtO	0.22u	31.20isv	.1825f	22.50gkvdd	33.00vscc	0.167n	0.2075ee
Drummed	CL	gal.	0.1220W	0.18i	0.1093	46.00avS	30.40bv	.....	.....	.1983	.....	.....	.....	.....	.....	.....	67.83vtO	.....	.....	.1825	40.00gkvdd	38.50	0.211n	0.2773w
Asph. cutback, MC																								
Tank car	CL	ton	0.1222W	0.9i	0.1163w	0.105awF	.10bwH	0.1165twAF	0.1165wSU	30.50	.....	30.24wlf	.0825cwJ	20.50dKx	0.105w	0.095ew	10.61uF	0.10U	0.1403fS	.09f	22.50gNdd	25.50KE	17.80nuE	0.222wee
Drummed	CL	gal	0.1258W	0.18wE	0.1188Ow	0.22awF	.18bwH	.....	.....	52.45	.....	.....	.....	.....	.....	.....	29.62uF	.....	.....	.092fw	46.50gNdd	.....	22.20nuE	0.2704
Road oil, tank car	CL	gal	.....	0.95i	0.1006O	0.14aOR	.08b	0.109	.....	.1100	.....	27.84v	.0675lc	19.50dvaa	0.95	0.085eB	.....	0.095U	0.14fS	.165f	23.25gvWdd	28.75hvY	0.155n	0.2334w
Asph. emul. RSI																								
Tank car	CL	ton	0.1288W	0.10i	0.1069	0.15OR	.....	0.1265	0.1265tA	0.1138	.....	.10	21.40jXv	0.137bb	0.095eBL	10.15u	.....	0.1403i	.18250	23.50gvXdd	25.80hvX	0.242n	0.212Zee
Drummed	CL	gal	0.1327W	0.19i	0.1093O	.....	.....	.....	0.21A	0.1983	.....	0.24	.....	.1842jXv	.....	0.1905eB	20.81u	.....	.....	.30	.2023gXdd	49.80hvrX	0.27nX	.268Zee

PAVING BRICK & BLOCK: *a Less 2% disc. 10th. *b 3 x 3½ x 8. *c 2¼ x 8 x 4. *d Truckload lots. *e Not used. *f 2" interior 6 lb tr. *g Less $1/Mdisc. 15th. *h 2" tr. 8 lb. *i 3 x 3½ x 8½. *j 2½", 6 lb. tr. *k Used. *l Redshale. *m Pine; oak $6.57. *n Truck del. *o Less $1 M disc. 15 days. –*p Used: $40; new: $80. *q Lots of 50M.

ASPHALTS: *a F.o.b. refinery, Everett, Mass. *b F.o.b. refinery, Lockport, Ill. *c F.o.b. Sugar Creek, Mo. *d F.o.b. refinery, El Segundo. *e F.o.b. Baton Rouge. *f F.o.b. Hartford, Ill. *g F.o.b. refinery, Richmond, Calif. *h F.o.b. Martinez. *i F.o.b. refinery, Baltimore. *j F.o.b. refinery, Inglewood, Calif. *k 50-110 penetr. *l Less than 100 penetr. *m 40/300 penetr. *n F.o.b. refinery, Montreal. Fed. tax included; add 8% for mun. & prov. *o Drums not avail. Shipped in steel bbl. *p 60/70 penetr. *r In customer's drums. *s Shipped in drums, per drum. *t 150/300 penetr. *u Per 100 gal. *v Per ton. *w Per gal. *x Also tank trucks *y F.o.b. Oakland. *z F.o.b. Edmonds. *A F.o.b. refinery, Cleveland. *B F.o.b. Destrehan, La. *E RC. *F Also RC. *G Also MS *H RC 0-5 incl. *I MC 4. *J MC, RC $0.095. *K MC 3, 4, & 5. *L MS. *M MC 1-5, RC 1-5, $0.0918. *N MC 3. *O Truckload. *P F.o.b. refinery, Atlanta. *Q F.o.b. Eldorado, Ark. *R Delivered within 50 mi. *S Less 2% disc. 10 days, net 30. *T Less 1% disc. 10 days. *U F.o.b. refinery. *V Less 2% disc. 15 days. *W SC 2. *X RS 1. *Y SC 1. *Z Incl. 10% Sales Tax. *aa SC 3, 4, & 5. *bb RS 3. *cc In used drums. *dd less disc of $1 ton. *ee 45 Imp. gal. drums *ff 60-150 penetration

Materials Prices

Monthly Market Quotations By ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Wood Products, Glass, Explosives, Chemicals: Last, Mar. 23; Next, Apr. 20.
- Wage Rates Building Board Insulation: Last, Mar. 30; Next, Apr. 27.
- Iron & Steel Products, Pipe: Last, Mar. 16; Next, Apr. 13.

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis	San Francisco	Seattle	Montreal	Toronto
STRUCTURAL CLAY TILE																							
partition-scored																							
3x12x12 in.	M	$186.10pe	$217.00	$135.00pss	$232.00†	$137.00ll	$179.00mmjvv	$205.00ff	$162.00	$170.00	$257.00	$158.00	r	$218.00pe	$178.00	$185.00h	$258.00ss	$200.00t	$180.00mmpp	$156.85*	$235.00pt	$168.78Ruqoo	$169.00rr
4x12x12 in.	"	154.95pkke	231.00	152.00pss	248.00†mm	149.00ll	190.00mmjvv	219.00f	162.00	185.00	274.00	158.00	r	225.00pe	178.00	197.00h	276.00ss	213.00t	190.00pp	177.10*	270.00pt	180.93auqoo	185.50rr
8x12x12 in.	"	309.90pe	434.00	.....	463.25†mm	280.00ll	355.00jddmm	410.00	318.75	310.00	514.00	312.00	r	452.00pe	371.25	294.00ch	517.00ssxx	400.00t	380.00pp	235.30dd	490.00pt	325.00ausqoo	360.00rr
Load Bear.ng—Scored																							
8x12x12 in.	"	348.65pe	491.00	303.00p	556.00†mm	.....	390.00jmmvv	465.00ff	387.00	310.00	582.00	312.00	r	225.00pwe	371.25	297.00hn	586.00ss	453.00t	410.00pp	159.40qq	265.00pwt	220.00qoo	281.50rr
10x12x12 in.	"	.....	602.00	376.00p	.....	.....	422.00jmmvv	.....	472.50	390.00	767.00	400.00	r	.....	.....	.....	.....	607.00t	440.00pp	.....	.....	400.00qoo	405.00rr
12x12x12 in.	"	.....	690.00	465.00p	.....	.....	500.00jmmvv	709.00ff	385.00	442.00	876.00	500.00	r	.....	.....	.....	.....	693.00t	621.50pp	.....	.....	.....	.....
BRICK, common backing	"	33.20uu	36.00	27.00ll	43.50p	32.00	50.00jk	43.25tt	30.00	35.00xx	53.50pmm	34.00	$42.00uu	49.50ype	42.00	46.00p	40.00mm	42.00t	44.00mmpp	43.00*	57.00t	48.25bll	25.00rr
Straight hard	"	36.70uu	41.00	38.00jl	58.00p	34.00	49.00jk	47.25ggtt	51.00	54.00	54.00pmm	34.00	44.00	58.00ype	55.00	.....	45.00mm	40.00t	45.50pp	43.00*	71.00t	56.30bll	65.00rr
LIME, in paper, Hyd. fin.	"	36.50hh	38.50	38.25mm	42.00ll	1.00aall	29.20jmm	32.75ptt	43.50	48.00p	38.00mm	36.26	38.00mn	150.00bbe	48.00p	40.00p	40.00mm	30.00t	1.00aapp	29.24	52.00bbt	39.00	34.00mm
" " " Com hyd.	"	28.50hh	23.40	20.87mm	34.00ll	0.90alaa	29.20jmm	28.00ptt	25.32	44.00p	30.00mm	34.26	38.00mnll	40.00bbe	40.00p	38.00p	24.50	26.00t	0.80aapp	29.24	38.00bbt	22.00	36.40mm
" " " pulverized	"	28.50hh	.....	26.33gmm	.....	.....	29.20jmm	.....	28.00	46.00p	40.00mm	29.76	39.00nnll	52.00bbde	.....	.....	27.50	34.00t	1.35zaapp	31.74	1.30mbbt	13.25	34.75mm

*§ F.o.b. yard. **F.o.b. plant Stockton. *† F.o.b. yard Roxbury. *a Smooth. *b $4.50 del. *c 8 x 12 x 12 in.-6 cell. *d Pulverized hot. *e less 5% disc., 10th. *f 8 x 8 x 12. *g Lumps, $26.72. *h F.o.b. trucks, job site N.Y.C. *i 60 lb sacks. *j Truck load or over. *k $1.00 discount pe. M, 10 days. * Red face. *m Per bb. 180 lb. processed. *n 7½ x 7½ x 12. *o Mason's double hydrated pressure. *p Truck lots. *q Provincia and Municipal tax extra (6%). *r Not used: earthquake danger. *s 8 x 16 x 12. *t less 2% disc., cash. *u Incl. Federal tax. *v Sand lime. *w 5 x 8 x 12. *x dumped. *y Chi common. *z Pebble; 80 lb sack. *aa 50 lb sack. *bb LCL. *dd 8 x 12 x 12. *ff 80% common. *gg Smooth. *hh less 25¢ disc., cash. *ii F.o.b. plant. *jj rough: smooth; $40. *kk 3½ x 11½ x 11½. *ll less 2% disc. 10th. *mm less 2%, 10 days. *nn F.o.b., L. A. *oo less 2%, 30 days. *pp add 2% sales tax. *qq 8 x 5½ x 11½. *rr 2½% disc., 10 days. *ss 5% disc., 10 days. *tt less 2% disc., 15th. *uu less 50¢/M, 10 days. *vv 4000 pcs. and over. *R revised eff. 7/1/59, direct delivery from manufacturer.

PAINT, ROOFING—F. O. B. CARLOAD LOTS

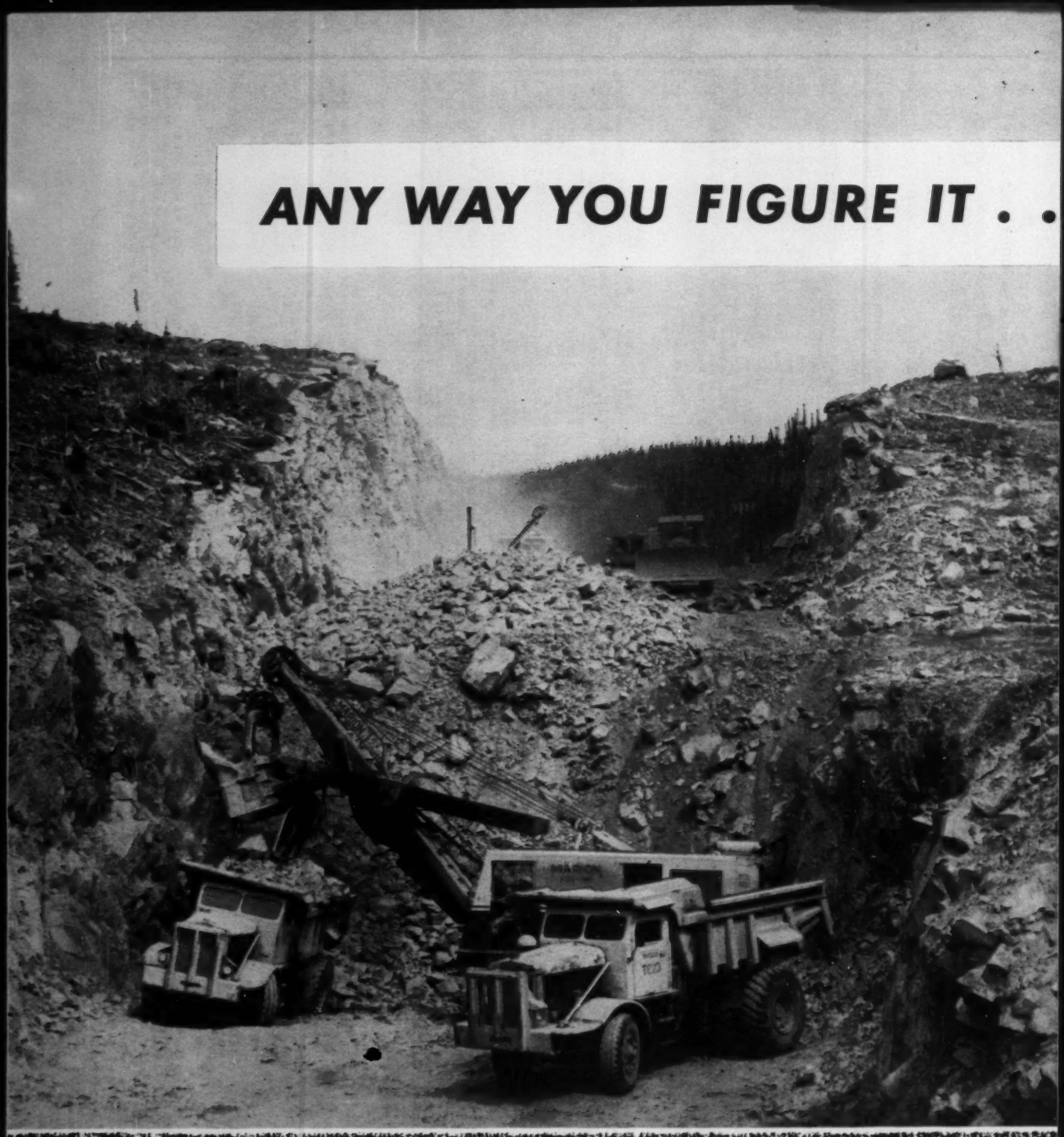
Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louis K	San Francisco	Seattle	Montreal	Toronto
LEAD, red, dry	CWT	$13.75ggJO	$17.50pp	$26.00†J	$24.95†oomm	$15.25rjqqpp	$15.25†JO	$25.65†	$22.50	$23.85n	$15.75r	$26.90ggool	$16.25yy	$17.25N	$23.00Jpp	$15.70ccO	$14.75mmO	$21.50mggJ	$25.65†m	$26.70mm	$13.35HO	$19.45O	$13.95
White, in oil	"	24.00ggJ	24.00	29.00†J	26.90†mmm	24.00†J	24.00†J	26.90†	23.50M	24.00	24.00rr	25.65	22.00	21.50kk	24.00J	29.75	19.00mm	24.00J	26.90	29.90mm	24.00H	29.00wtt	20.85
READY-MIXED PAINT																							
Graphite b	gal	3.59	3.00	3.90J	.....	.....	.....	3.16ggP	.....	3.70	....mm	3.99	3.30	.....	.....	.....	3.35mm	2.20#EJ	.....	3.20mm	.....	5.52Dfft	5.15J
Aluminum	"	3.86	4.40	3.40J	.....	.....	.....	3.27zzgg	3.25B	5.10	....mm	3.43	4.50n	.....	.....	.....	3.90mm	2.25#FJ	.....	4.30mm	4.19ceffJ	6.55xff	6.18J
Ferric Oxide	"	3.31	3.50	.....	.....	.....	.....	4.20qgg	.....	.....	....mm	3.01	4.20n	.....	.....	.....	3.65mm	2.25#GJ	.....	3.50mm	.....	5.10kfft	5.95J
ROOFING SUPPLIES	square	2.90kk	3.06	2.95†mm	3.55q	3.45ukk	2.99mm	2.85q	3.00u	2.94	2.85mm	3.00mm	3.40nkk	2.85kk	$2.78	2.79xx	.....	2.90nH	2.99iismm	2.87mm	3.70ccH	5.40	3.50
Rolls, slate surf	CWT	2.25kk	3.67	2.17ii†mm	2.60q	2.75okk	2.19mm	2.10o	3.00o	2.25o	2.10ommll	2.50omm	2.40njkk	2.10hikk	1.98	1.91xxo	2.65	2.15eH	2.19hhK	1.72aaiimm	3.06heeH	4.65f	2.75aae
Asphalt felt	"	2.85kk	4.04	3.17ii†mm	3.04q	3.15okk	2.64omm	2.55o	3.00o	2.80o	2.55ommll	2.50omm	.....	2.55bikk	2.85	2.46o	1.81	2.15H	2.64hhK	2.59mm	.....	4.65f	2.75o
Asphalt coating	gal.	0.67kk	0.50	0.76ffmm	0.55q	48.00bbkk	0.56ymm	0.41y	0.47O	0.50f	0.56ffmm	0.55y	0.75nykk	0.52ikk	0.68	0.52r	0.74	0.56H	0.58yK	0.46jj	0.59cc	1.60	0.70j
tar pitch	ton	65.35kk	54.00	48.00eemm	60.00q	57.70†kk	55.96Hmm	49.00gg	66.00hh	50.00	49.00mm	.....	s. ...	50.00rkk	45.50	49.00*	49.00	55.00H	57.60K	54.00	.....	4.40uu	57.00A

*† Delivered. * Note: Red lead in oil 50% higher than white lead in oil. ** Aver. wt. approx. 425 to 550 lb drums. *a Red lead prices change frequently due to pig lead price changes. *b U.S. War Dept. Spec. 3-49A. *c ASTM Spec. D266-31. *d 80% minimum ferric oxide. *e Per 108 sf roll. *f Per 432 sq ft. *g F.o.b. yard Roxbury. *h Per roll, 65 lb. *i Net carload prices, Minneapolis and vicinity. *j 45 gal containers. *k Over 50% ferric oxide. *l Not used. *m 100 lb keg. *n F.o.b. city. *o Per 50 lb roll. *p 6-drum, 50 gal each. *q Per 90-lb roll. *r F.o.b. factory, Chicago. *s Truckload. *t Incl. Federal tax. *u Per 90-lb square. *v Per ton. *x Ready-mixed. *y 55-gal container. *z Drums. *aa 15 lb. *bb Roofers coating and cement. *cc LCL, truck delivery. *ee Asphalt pitch in 100 lb package. *ff 5-ga drums. *gg F.o.b. factory. *hh Incl. freight. *ii Per 324 sf roll. *jj Asbestos roof coating. *kk less 2% disc., 10th. *mm less 2% disc., 10 days. *oo 100 lb bbls. *pp 50 or 100 lb bags. *qq 500 lbs or more. *rr F.o.b. plant, Detroit. *ss 50 lb bbls. *tt 25 lb kegs. *uu 250 lb bbls. *xx Sept.: Rolls revised to $2.75, Asph. Felt revised to 1.71. *yy Sept. revised to $12.00. *zz Sept. revised to $2.80. *A 400 lb barrels. *B ASTM Spec. D962-49. *C 96%. *D Std. black. *J Milt. spec.: *E TTP27; *F TTY81; *G TTP31. *H less 2% disc., cash. *I Per 100 lb. *J less 1% disc., 10 days. *K add 2% sales tax. *L CL. *M 1 ton or more. *N under 500 lbs, add $1. *O 50 lb. bag.

PLASTER, VERMICULITE AND METAL BUILDING SHEETS

Item	Unit	Atlanta	Baltimore	Birmingham	Boston	Chicago	Cincinnati	Cleveland	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minneapolis	New Orleans	New York	Philadelphia	Pittsburgh	St. Louisuu	San Francisco	Seattle	Montreal	Toronto
PLASTER, neat	ton	$32.00ss	$24.00	$37.00ss	$25.00	$1.45bbtt	$24.95**ss	$29.00**ss	$34.50	$29.00	$28.00ss	$30.00	$28.00tt	$36.00F	$34.00	$27.00	$27.00	$30.00nn	$30.00	$29.50ss	$42.40nn	$22.60h	$0.70bb
gauging	"	42.00ss	35.70	43.00ss	30.00	1.45bbtt	24.95*	45.00N	34.50	29.00	28.00ss	35.00	29.00tt	36.00F	48.00	35.00	33.00ss	31.00nn	42.00	30.50ss	45.60nn	35.60h	1.25bb
VERMICULITE																							
Home insul. pellets	4 cf bag	1.55ss	0.95	1.55ss	1.40	1.55	1.75*ss	1.14ss	1.05	1.63	1.27ss	1.19E	1.25	1.65tt	1.32P	1.40	1.40ss	1.25nn	1.50	1.38ss	1.55nn	1.25h	1.47bb
plaster agg.	"	1.65ss	....	1.55ss	1.40	1.60	1.75*ss	1.16ss	1.21	1.40	1.31ss	1.21E	1.20ktt	1.80F	1.23P	1.35	1.25ss	1.30nn	1.60	1.38ss	1.35knn	1.40h	1.43bb
concrete agg. treated	"	1.80ss	....	1.60ss	1.40	1.60	1.85*ss	1.24ss	1.37	1.50l	1.40ss	1.29E	1.45	1.95Fl	1.40P	1.40	1.45ss	1.40mm	1.65	1.50ss	1.85lnn	1.60h	1.66bb
PERLITE, plaster agg.	"	1.65ss	1.15	1.27ss	1.55ss	1.60	1.75ss	1.45ss	1.21	1.50ss	1.45kii	1.21	1.16	1.40S	1.15P	1.35	1.05ss	1.40nn	1.50	1.38oss	1.50k	1.15v	1.14Q
concrete agg. untreat.	"	1.65ss	1.55	1.27ssl	1.55ss	1.60	1.75ss	1.45ss	1.32	1.60ss	1.50kii	.....	1.26	1.50S	1.15P	1.40	1.05qqss	1.40nn	1.60	1.58oss	.....	1.15v	.....
BUILDING SHEET																							
Alum. flat, .100"	lb	0.463noo	0.462	0.459M	0.474	0.564x	0.469	0.459aa	0.469	0.479	0.475a	0.463	0.459	0.469	0.469	0.489aT	0.479	0.475	0.479	0.575	0.50D	43.95AH	0.4375
corr. roof, .032"	shee.	27.17nY	0.451r	9.66K	25.07AAp	33.43p	9.35	25.07p	0.484r	10.89	10.35a	24.66ggyyp	8.772Z	10.09	33.43	0.2507aXAA	10.98	10.39	9.18	10.83	10.75D	12.10H	26.00ap
Stainless steel, 20 ga	CWT	65.68nxx	63.00	64.50K	64.42*ddxx	64.15ee	61.00xx	63.33ooxx	64.09	65.32gg	63.00axx*	67.50E	65.02	63.61GR	63.00Y	64.08a	63.71	63.00	63.39Kmmgg	65.00K	54.02D	65.75H	73.74
28ga	"	74.43nxx	71.25	73.00K	72.67dd	72.40ee	71.25xx	71.58ooxx	72.34	73.57gg	71.25axx*	76.25E	73.27	69.61ffG	83.50Y	72.33a	71.96	74.50pp	71.64ygg	77.25K	73.27D	.....	86.52

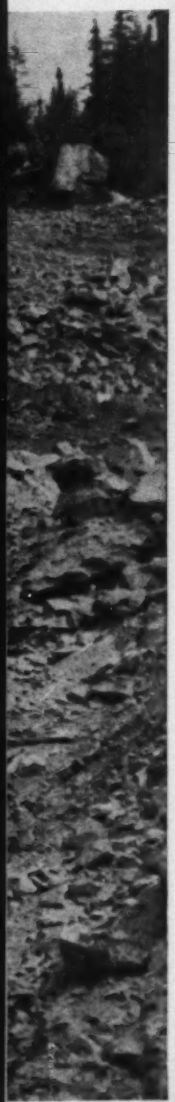
*‡ trucklots, delivered *† lob warehouse. ** ob city. *a delivered. *b 1/2" O.D. *c 5/8" O.D. *d per sh. *e 34" x 60" sheet. *f per 100 ft. *g 5 tons & up: cold roll, anneal & pickled 2B finish. *h Incl. Federal tax. *i add 25¢ per pint of additive. *j 1100 & 3003 alloy, mill finish. *k bag of 3 cu ft. *l treated with air entraining agent. *m 2-10M ft. *n lob mill or equalized with nearest stocking competitor. *o 250 sacks or more. *p 100 sc ft. *r per lb. *s 30 lb bag. *t 36" x 108";-10.81 lb/sh; 48" x 144"; 21.7 lb/sh. *u 19.31 b/sh *v lob plant. *w 48 x 144" *x 0.11"th. *y 27 gauge *aa 16M b & up. *bb Per 50 lb bag. *dd add $1.00 cwt boxing *ee ton & up. *gg add $2/cwt boxing; $0.75/cwt on skids. *hh Theoretical wt for 48" x 96": 60.4-lb per sh. *ii 300-bag lots *jj 100-lb bag. *mm Theoretical wt; 19.7-lb per sh. *nn 2% cash. *oo skid packed. *pp type 304. *qq Philadelphia and suburbs. *rr less 2% disc. 15 days. *ss less 2% disc. 10 days. *tt less 2% disc. 10th. *uu add 2% sales tax. *vv Type N. *xx less 1/2% disc. 10 days. *yy .021 ga. *zz .061" th. *A Per 100 lb. *C 15M lb. *D less 1/2% for cash. *E Quantity differential. *F less 5% disc. 10th. *G less 1/2% disc. 10th. *H Fed. tax exemp.. *K less 1/2%, 10 days. *L 5% disc. 30 days. *M 3003: .462 for 1100. *N less 2%, 15th mo. *O less $2, cash & carry. *P less 2%, 15 days. *Q per ton. *R revised. *S add .10/bag under 200 bags. *T 5000# quantity on 4000# skids. *U 30 Msf quantity; $0.245 in 10 Msf quantity. *X per sq ft. *Y per sheet. *Z 6,000 lb or over. *AA 30,000 sf or over.



GM GENERAL MOTORS EUCLID

EUCLID

FOR MOVING EARTH, ROCK, COAL AND ORE



."Euc" Rear-Dumps are your best investment

Reliable job-proved performance, backed by competent and well stocked dealer parts and service facilities, makes "Euc" Rear-Dumps your best bet for top production at lowest over-all cost.

There are lots of ways to compare hauling equipment but no matter what method you use there's only one real measure — reliable performance on the job.

For over 25 years Euclid Rear-Dumps have been the outstanding choice of contractors, mines, quarries and industrial users of off-highway haulers. More than half of the orders for new "Eucs" are from previous owners — repeat business that is the best evidence of customer satisfaction with the product and the service available from Euclid dealers.

With this unequalled field experience and continuous product improvement, "Eucs" give you operating advantages that cut downtime and provide greater work-ability. An experienced dealer organization with complete parts stocks and service facilities is further assurance that your "Eucs" can always be kept in top shape wherever they may be working.

You can depend on "Eucs" and your Euclid dealer for bonus benefits that don't show in the specs but are mighty important in making Euclids your best investment.

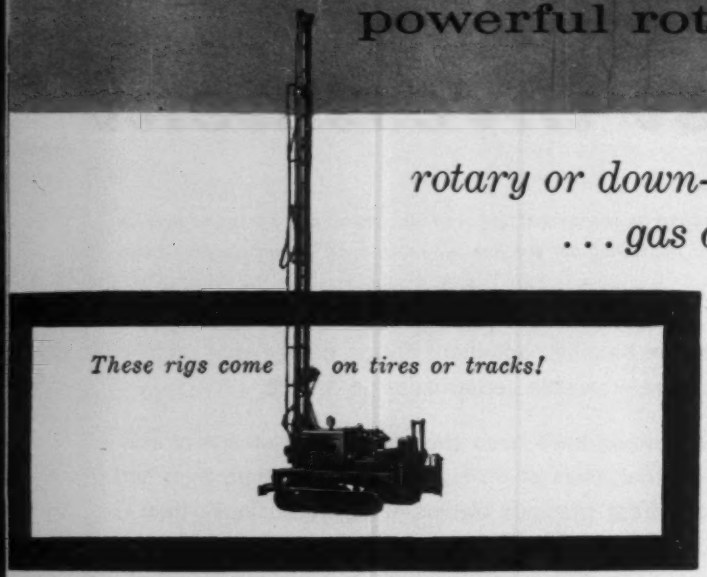
EUCLID Division of General Motors, Cleveland 17, Ohio

Plants at Cleveland and Hudson, Ohio and Lanarkshire, Scotland

Euclid pioneered many of the rear-dump features that are "standard" today . . . free floating springs, planetary type final drive, exhaust heated bodies, Torqmatic Drive with torque converter and semi-automatic transmission, double acting hoist and other engineering advances that cut hauling costs.

LE ROI LRD-2 for low cost, powerful rotary drilling

rotary or down-the-hole drilling ... gas or diesel



Here's a highly portable blasthole drill for drilling holes up to 4½ inches as deep as 30 feet... equipped for either positive-drive rotary drilling or powerful down-the-hole percussive drilling.

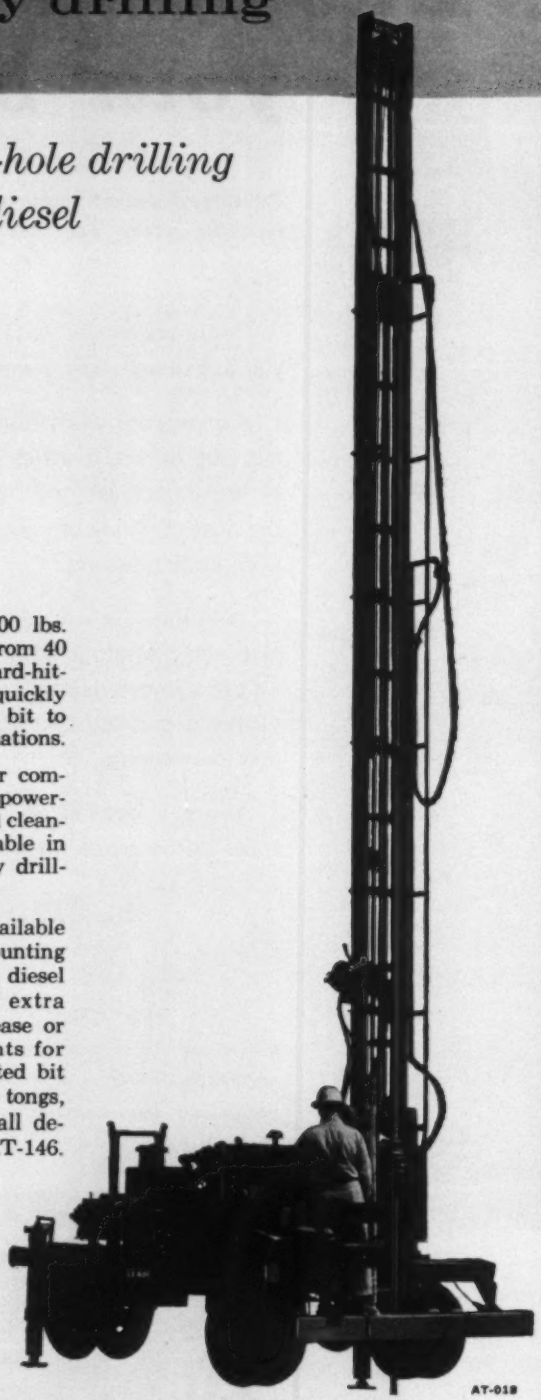
What's more, the LRD-2 is completely self-contained... and economically priced, too!

The entire unit is easily handled by one man. Controls are conveniently grouped at an operator's station located alongside the drilling area. The unit can be moved, leveling jacks hydraulically set, mast hydraulically raised, drill pipe and bits connected, and hole started all with a few non-fatiguing motions.

Powerful direct mechanical drive keeps the rotary table turning — won't bog down or lose torque under rough going like air or hydraulic driven units — eats through tough rock formations under 10,000 lbs. pulldown pressure at speeds from 40 to 250 rpm. If necessary, a hard-hitting down-the-hole drill can quickly be substituted for the rotary bit to drill extremely hard rock formations.

A Le Roi 25 hp two-stage air compressor provides ample air for powering the down-the-hole drill and cleaning out hole . . . or is available in single-stage where only rotary drilling is necessary.

The self-propelled LRD-2 is available either on crawler or tire mounting and with either gasoline or diesel power unit. A whole list of extra equipment is available to ease or speed drilling, including lights for night-time operation, a mounted bit grinder, air hoist, breakout tongs, water injection system, . . . all detailed in Specification Sheet AT-146. Write for your copy.



LE ROI

division of Westinghouse Air Brake Co.

Sidney, Ohio

Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

BUILDINGS—BA

▲ **Conn., Torrington**—BA 4/19—Town, Purch. Agt., Town Hall, 3 story, 4 unit 2-wing HIGH SCHOOL, Elise Bease Park. $2,565,000. Plans deposit $100. Nichols & Butterfield, 998 Farmington Ave., West Hartford, archts. Marchant & Minges, 1 Park Dr., Farmington, engrs. CD 1/26/61.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

▲ **New York and New Jersey**—BA 4/20—Ch. Engineer, Port of New York Authority, 111 Eighth Ave., Rm. 1100, New York 11, N. Y., Contr. GWB-190.243, constr. DIRECTIONAL SIGNS for lower level expansion of George Washington Bridge. Plans deposit $50. CD 8/15/57.

BUILDINGS—BA

▲ **Pa., Phila.**—BA 4/11—St. Christopher's Hospital for Children, 2600 N. Lawrence St., Phila., (selected list of bidders) IN-PATENT HOSPITAL. $2,962,639. Martin Stewart & Noble, 117 S. 17th St., archts. Allabach & Rennis, 16 S. Broad St., engrs. CD 2/21/61.

▲ **N. J., Hightstown**—BA 4/14—National Lead Co., 111 Broadway, New York, N. Y., RESEARCH LABORATORY, SEWAGE TREATMENT PLANT. $5,000,000. The Ballinger Co., 1625 Race St., Phila., Pa., archt. CD 12/6/60.

▲ **N. Y., Glendale**—BA 4/17—Brooklyn Diocesan Bldg. Office, 191 Joralemon St. Brooklyn, Zone 2, Christ the King Diocesan HIGH SCHOOL, Metropolitan Ave. and 69th Sts. $9,000,000. Stickle & Assocs., 2422 Prospect Ave., Cleveland 15, O., archt. CD 4/12/60.

▲ **N. Y., Jamaica**—BA 4/18—New York Telephone Co., 140 West St., New York 7, CENTRAL TELEPHONE OFFICE and COMMUNICATION SYS. for New York International Airport. $5,000,000. Voorhees, Walker, Smith, Smith & Haines, 101 Park Ave., New York 17, N. Y., archts. Bids Feb. 7 rejected. CD 2/3/61.

▲ **N. Y., Bayside**—BA 4/24—Diocese of Brooklyn, 191 Joralemon St., Brooklyn, Zone 2, Bishop Edmund J. Reilly HIGH SCHOOL, Long Island Expressway and Francis Lewis Blvd. $5,000,000. Eggers & Higgins, 100 E. 42nd St., New York, Zone 17, archts. CD 6/6/60.

▲ **N. Y., Rochester**—BA 5/18—Rochester-Monroe County Civic Center Comn., Monroe County Purchasing Agent, Monroe County Court House, general constr. Contr. 4G, plumbing work, Contr. 4P, heating, ventilating and air conditioning work Contr. 4 H&V, electrical work Contr. 4E, vertical transportation work, Contr. 4X, COURTS BLDG. Plans deposit $100. Todd & Wiard, 311 Alexander St., Rochester 4, N. Y., archts.

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, bids opened 3/29, ROADS,

N. Y.—**Torrington Const. Co.**, P. O. Box 336, 116 E. Main St., Torrington, Conn. LB **$2,358,369.41**, est. $4,033,000, (7 bidders), b. conc. 2.76 mi. (1.79 acc.) 1 HGSC comp. beam 4 sps. 227.2 ft total, 2 bridges welded steel plate girder, 3 spans 319 ft total, 3 spans 319 ft total, 5 HGS prestressed conc., 3 spans 139.4 ft total, 3 spans 151.3 ft total, 3 spans 121.8 ft total, 3 spans 121.8 ft total, 6 spans 351.3 ft total Int. Rte. 502, Sections 7A1 and 7A2, Rte. 9 to Rte. 22, FISH 61-8. Proj. I-87-4 (18), Clinton and Essex Counties;

N. Y.—**Depew Paving Co., Inc.**, 161 Woodlawn, Depew, N. Y., LB **$2,217,353.50**, est. $2,400,000, (5 bidders, cem. conc. pavt. 1.96 mi. misc. work 0.08 mi. HGS No. 9, 2 comp. I-beam Brs. 1 span 75.1 ft. 1 span 75.1 ft. HGS No. 8, rehabilitating bridge Interstate Rte. 506, Niagara Expressway-Contr. 4 (Gill Creek to Cemtery Rd. Rte. 190 FINIE 61-3. Proj. I-190-1(30), Niagara Co.;

N. Y.—**Colonial Asphalt Paving & Mt. Vernon Constr. Corp.**, 22 W. 1st St., Mt. Vernon, N. Y., LB **$2,585,529.80**, est. $2,672,000, (2 bidders), b. conc. 6.34 mi. 2 brs. comp. I-beam, 1 sp. 68.15 ft., 1 sp. 48.31 ft., alterations to Dam Bridge, Seven Lakes Parkway (Sloatsburg to Kanawauke Circle) SLP 61-1, Rockland-Orange Counties;

N. Y.—**John Arborio, Inc.**, W. Cedar St., Poughkeepsie, N. Y., LB **$3,832,242.53**, est. $4,560,000, (5 bidders), 9 in. cem. conc. pavt. 5.4 mi. (1.73 acc.) 2 HGS comp. I-beam, 1 span 78.4 ft., 4 spans 226.80 ft. total, welded plate gird. br. 2 spans 275 ft. total Kingston By-Pass Pt. 1, Rte. US 209 to Rte. N. Y. 28 (Kingston-West Hurley), SH 5173, Rte. 28 FAS 61-9, FARC 61-32, Proj. F-FG-U-395(7), F-1009(5), Ulster Co.;

N. Y.—**Yonkers Contg. Co., Inc.**, 969 Midland Ave., Yonkers, N. Y., LB **$3,427,123**, est. $3,953,000, (8 bidders), 9 in. cem. conc. pavt. 3.57 mi. (3.28 acc.) 2 HGS comp.; WF beam brs. 3 spans 159 ft. total, 3 spans 213 ft. total Interstate Rte. 402 (Gurney Lane to Luzerne Rd.) Rte. 87, FISH 61-3, Proj. I-87-3(37), Warren Co. CD 2/28/61.

▲† **Peter Kiewit Sons Northern Comp. & Danish Arctic Contractors**, 122 E. 42 St., New York 17, N. Y., U.S.A., CA **$5,744,600** Base Bid Items 1-76, misc. items (CY-61) to incl. rehabilitation existing ELECTRICAL DIST. SYS., modify standby power for ILS plants, Tacan and Control Tower (THu 116-9) repair to heat distr. sys., alterations and replacement of gate valves in heat distr. sys., repair of mechanical rooms; repairing of roofs; utilities (CY 61) ENG-30-347-61-21, THULE AIR BASE, GREENLAND. U. S. Eng., 346 Broadway, New York 13, N. Y., U.S.A. BA 3/8, CA 3/15. CD 3/10/61, under LB.

BUILDINGS—LB & CA

▲ **Adson Industries, Inc.**, 116-25 Queens Blvd., Forest Hills, N. Y., and **Taylor International Corp.**, 420 Lexington Ave., New York 17, N. Y., CA Est. **$8,000,000**, CADMAN PLAZA, two 20 story APARTMENTS, forty-five TOWN HOUSES, bounded by Monroe Pl., Pineapple, Henry Fulton and Clinton Sts., BROOKLYN, N. Y. Cadman Plaza, c/o Max Mishkin, sponsor, 270 Shore Rd., Long Beach, N. Y. Mayer, Whittlesey & Glass, 31 Union Sq., New York 3, N. Y., archts. CA 3/15/61.

▲ **Wilaka Constr. Co., Inc.**, 11 E. 44th St., New York 17, N. Y., CA **$3,668,000**, Proj. NY 5-488 fdns. and general contract, E. Robert Moore HOUSES, E. 149th St., Jackson Ave., E. 147th St., Trinity Ave. and St. Mary's Park, Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., Rm. 312, 299 Broadway, New York 7, N. Y. BA 2/21/61. CA 3/13/61. CD 2/24/61, under LB.

Paramount Plumbing & Heating Co., 336 E. 92nd St., New York 28, N. Y., CA **$598,750**, plumbing contract, E. Robert Moore HOUSES (New York, N. Y.).

▲ **Frouge Constr. Co., Inc.**, 680 5 Ave., New York 19, N. Y., LB **$4,434,600**, (4 bidders), fdns. and general contract Baychester HOUSES, Proj. NYS-92, Schieffelin Ave., E. 229 St., Schieffelin Pl. and E. 225 St., Bronx Boro, NEW YORK, N. Y. New York City Housing Auth., Rm. 312, 299 Broadway, New York 7, N. Y. BA 3/28, CD 3/23/61;

AFGO Engineering Corp., 475 Adelphi St., Brooklyn 17, N. Y., LB **$569,453**, (4 bidders), heating and ventilating, Baychester HOUSES (New York, N. Y.);

Arc Electrical Constr. Co. Inc., 739 Second Ave., New York 16, N. Y., LB **$428,000**, (5 bidders), electrical, Baychester HOUSES (New York, N. Y.);

Glass Brothers, Inc., 2623 Jerome Ave., New York 68, N. Y., LB **$659,711**, (5 bidders), plumbing, Baychester HOUSES (New York, N. Y.).

▲ **Vermilya-Brown Co., Inc.**, 100 E. 42 St., New York 17, N. Y., CA Est. **$5,720,000**, one 10 story, and one 15 story Wickham Terrace APARTMENT, 5.65 acres, Burke, Gunther, Givan and Brunner Aves., Bronx Boro., NEW YORK, N. Y. David Kamuman, 11 W. 42 St., New York 36, N. Y. Hippolyte Kamenka, 475 5 Ave., New York 17, N. Y., archt.

▲ **J. & N. Rappaport**, 456 Sylvan Ave., Englewood Cliffs, N. J., CA Est. **$3,000,000**, 14 story APARTMENT, W. Jersey and Chilton Sts., ELIZABETH, N. J. Chilton Towers, Inc., 456 Sylvan Ave., Englewood Cliffs, N. J. CD 1/12/60.

▲ **U. S. Home Development Corp.**, 52 Neil Ave., Lakewood, N. J., Owner Builds, Over **$3,000,000**. 200 HOUSES, Rtes. 79 and 9, FREEHOLD, N. J. Paul West, 911 North Main St., Toms River and John Codoma, 505 Hillside Ave., Point Pleasant, N. J., archts.

▲ **Robilt, Inc.**, 230 First St., Lakewood, N. J., Owner Builds, **$6,000,000**. 600 unit RESIDENTIAL DEVELOPMENT, LAKEWOOD, N. J.

▲ **David Slott**, 1416 Bywood Ave., Upper Darby, Pa., Owner Builds, **$4,160,000**, RESIDENTIAL DEVELOPMENT (260), Brown Lee Rd., KING OF PRUSSIA, PA. David Slott, 1416 Bywood Ave., Upper Darby, Pa., archt.

▲ **Burkey Constr. Co.**, P.O. Box 3218, Reading, Pa., CA **$3,000,000**, PLANT, OFFICES, parking area, READING, PA. Greater Berks Development Fund, 52 N. 4th St., Reading, Pa. Greater Berks Associated Archts., 5th and Walnut St., Reading, Pa., archts. Kneas & Long, 504 Woodland Terrace, Phila., Pa., engrs. BA 11/1/59. CD 3/15/61.

SOUTH

HEAVY CONSTRUCTION—SLC

▲ **Va., Norfolk**—Norfolk and Western Railway 8 North Jefferson St., Roanoke, soon lets contract SUBSTRUCTURE and DECK, 1,380 x 83 ft. rein.-con. deck on concrete piles for Coal Pier. Hayes, Seay, Mattern and Mattern, 1615 Franklin Rd. S. W., Roanoke, Va., archts.-engrs. Palmer & Baker Engineers, Inc., 2460 Government St., Mobile, Ala., engr. CD 12/5/60.

HEAVY CONSTRUCTION—LB & CA

▲ **J. A. Jones Constr. Co.**, Church St., Nashville, Tenn., LB **$4,960,000**, est. $5,322,300 (11 bidders), TERMINAL for Memphis Airport, MEMPHIS, TENN. City, City Hall, Memphis, Tenn. CD 10/23/59.

BUILDINGS—LB & CA

▲† **H. L. Coble Constr. Co.**, 1705 Battleground Ave., Greensboro, N. C., LB **$5,715,741**, 430 CAPEHART HOUSING UNITS, Turner Air Force Base, INV.-09-629-61-29, ALBANY, GA. Base Procurement Office, Turner Air Force Base, Albany, Ga., BA 3/14/61. (**Correction**—low bidder). CD 3/21/61, under LB.

MIDDLE WEST

▲† **O., Dayton**—BA 4/17—Procurement Officer, Wright-Patterson Air Force Base, remodeling Page Manor APARTMENTS, Wright-Patterson Air Force Base. CD 11/4/60.

▲ **Ill., Chicago**—BA 4/25—Dpt. Purchases, City Hall, Zone 2, No. 80.75-60-40A, Southwest INCINERATOR PLANT, 1400 Pershing Rd. $7,500,000. CD 9/1/60, under LB.

BUILDINGS—BA

▲ **O., Garfield Heights**—BA 4/20—Bd. Educ., 4900 Turney Rd., HIGH SCHOOL. $3,000,000. Plans deposit $60. George S. Voinovich, 1922 E. 107th St., Cleveland, Zone 6, archt. CD 12/1/59.

BUILDINGS—SLC

▲ **Ill., Kankakee**—Armour & Co., 400 N. Wabash St., Chicago, soon lets contract three 150,000 sq. ft. EDIBLE FATS PLANT bldgs. $4,500,000. Giffels & Rosetti, Marquette Bldg., Detroit, Mich., archts. CD 1/12/61.

BUILDINGS—LB & CA

▲ **Hunkin-Conkey Co.**, 1740 E. 12th St., Cleveland 14, O., CA Est. **$5,000,000**, RESEARCH BLDG. for Medical School, CLEVELAND, O. Western Reserve University, 2040 Adelbert Rd., Cleveland 6, O. BA 1/17. CD 12/29/60.

▲ **North Star Homes, Inc.**, 20515 Shaker Blvd., Cleveland 22, O., Owner Builds, **$3,000,000** ($1,500,000 first year, 2 year Program) 200 HOMES, Ledge Rd. and North Plaza Dr., NORTHFIELD, O.

▲ **Huber, Hunt & Nichols, Inc.**, 2450 S. Tibbs St., Indianapolis, Ind., CA, general contract, 2 story RESEARCH-ENGINEERING BLDG., ANDERSON, IND. Delco-Remy Div., General Motors Corp., 2401 Columbus Ave., Anderson, Ind. Total est. **$8,000,000**. CD 8/29/60;

International Steel Co., 1321 Edgar St., Evansville, Ind., CA, steel contract for RESEARCH-ENGINEERING BLDG. (Anderson, Ind.).

▲ **Leo C. Miller Co., Inc.**, 333 E. Bloom St., Louisville, Ky., LB **$3,579,000** (7 bidders), Floyd County HOSPITAL ADDN., NEW ALBANY, IND. New Albany and Floyd Co. Building Auth., Courthouse, Spring and State Sts., New Albany, Ind. BA 3/28/61. CD 2/27/61.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

▲† **New Mexico**—BA 4/11—U. S. Eng., P. O. Box 1538, Albuquerque, Two Rivers RESERVOIR PROJ., Rio Hondo, Roswell, Chaves Co., ENG-29-005-61-9. $5,500,000. Extended date. CD 2/20/61.

▲ **Okla., Oklahoma City**—BA 4/19—Oklahoma City Airport Trust Auth., First National Bldg., Zone 2, AERO-MEDICAL BLDG., Will Rogers Airport, $8,000,000. Plans deposit $100. Hudgins Thompson & Ball, 1411 Classen St., Oklahoma City, archts. Federal Aviation Agency will lease.

BUILDINGS—BA

▲ **Minn., St. Paul**—BA 4/25—Bd. Educ. Special School Dist. No. 2, 628 City Hall and Court House, Harding HIGH SCHOOL, near Fremont Ave. and Hazelwood St., swimming pool. $3,500,000. Haarstick, Lundgren & Associates, Inc., N-212 First National Bank Bldg., archt. CD 12/1/59.

▲ **Colo., Denver**—BA 5/2—University of Denver, Evans and University, two 170,000 sq. ft., 1 story, full bsmnt., 648 units RESIDENCE HALLS, two 10 story TOWERS. $2,900,000. Perkins & Will, 309 W. Jackson Blvd., Chicago, Ill., archts. Edwin A. Francis, 218 E. Speer Blvd., assocs. archt. CD 1/19/60.

▲ **Tex., Fort Worth**—BA 5/4—Tarrant Co., Fort Worth, 12 story, 175,000 sq. ft., masonry, steel, concrete JAIL and CRIMINAL COURTS BLDG. ADDN. $3,500,000. Easterwood & Easterwood, 522 N. P. Anderson Bldg., archts. CD 1/17/61.

▲ **Tex., Dallas**—Bids Asked—W. W. Caruth, Jr., 355 Hillside Village, Dallas, DEPARTMENT STORE, N.W. Hy., Abrams Rd. and Skillman Ave. $2,750,000. Medallion Dpt. Store, lessee. CD 2/24/61.

HEAVY CONSTRUCTION—LB & CA

▲† **H. B. Zachry Co.**, End of West Harding Blvd., P.O. Box 10188, San Antonio, Tex., CA **$7,502,946**, SPILLWAY and EMBANKMENT, John Redmond Reservoir, Grand (Neosha) River, Coffee and Lyon Counties, near Burlington, KANSAS. U. S. Eng., P.O. Box 61, Tulsa, Okla. (**Correction**—contractor). BA 2/24/61. CD 3/14/61, under CA.

▲† **Elmer C. Gardner, Inc.**, P.O. Box 19071, Houston, 24, Tex., CA **$5,378,445**, SPILLWAY, Waco Dam and Reservoir, near Waco, ENG-41-443-61-65, TEXAS. U. S. Eng., Box 1600, Fort Worth, Tex. BA 3/15/61. CD 3/17/61, under LB.

BUILDINGS—LB & CA

▲ **C. F. Braun & Co.**, 1000 S. Fremont Ave., Alhambra, Calif., CA **$5,653,000**, AMMONIA PLANT, DEER

PARK, TEX. Diamond Alkali Co., Deer Park, Tex. CD 3/7/61.

▲ **M. C. Cole & Co.**, 2701 S.1, Garland, Tex., Owner Builds, $4,016,200, 320 one story, brick veneer, DWELLINGS, Sect. 1 and 2, GREENVILLE, TEX. Jas. Duff & Associates, Garland, Tex, engrs.

▲ **J & E Building Co.**, Don Lomax, John Anderson, Earl Gilbert, Melrose Park, Houston, Tex., Owner Builds, $6,000,000, 465 DWELLINGS, Melrose Park, North Houston, HOUSTON, TEX.

▲ **El Paso Natural Gas Co.**, El Paso Natural Gas Co. Bldg., El Paso, Tex., Owner Builds, $7,500,000, LPG EXTRACTION PLANT, 650 mil. cu. ft. gas and 14,000 bbls. hydrocarbons daily, JAL, N. M.

FAR WEST

HEAVY CONSTRUCTION—BA

▲ **Calif., Los Angeles**—BA 4/19—Los Angeles Harbor Dpt., City Hall, open concrete WHARF at Berths 51 through 55, Outer Harbor District, $2,000,000 for 1,800 ft. wharf, or $3,000,000 for alternate 2,900 ft. wharf. CD 5/18/60.

▲ **Oregon**—BA 6/1—Portland General Electric Co., 721 SW Alder St., Portland, DIVERSION TUNNEL, Round Butte Hydro-electric Project. John Bankus, c/o owner, engr. CD 12/5/58.

BUILDINGS—SLC

▲ **Calif., Tracy**—Owens-Illinois Glass Co., 350 Sansome St., San Francisco, Calif., soon lets contract 1 story tilt-up concrete walls, steel columns, etc. GLASS CONTAINER PLANT, near here. $3,000,000. John Sardis & Assoc., 64 Pine St., San Francisco, archts. CD 2/13/61.

HEAVY CONSTRUCTION—LB & CA

† **Bureau Reclamation, Dpt. Interior, Page, Ariz.**, rejected bids Mar. 21, FOUNDATIONS and FURNISHING, and ERECTING STEEL TOWERS for Glen Canyon-Four Corners 230 kilovolt transmission line, Transmission Division, Colorado River Storage Project, DC 5494 ARIZONA. LB $4,520,303. Will re-advertise. CD 3/24/61, under LB.

▲ **WASHINGTON**—State Hy. Comn., Transportation Bldg., Olympia, Bids opened 3/28, ROAD,
Sound Constr. & Engineering Co., 1300 Aioha St., Seattle, Wash., LB $5,548,329, (7 bidders) paving, tunnel and bridges, Seattle Freeway, King Co. CD 2/23/61.

▲ **CALIFORNIA**—State Div. Hys., 1120 N. St., Sacramento, Bids opened 3/23, BRIDGE,
Kaiser Steel Corp., 7301 Telegraph Rd., Montebello, Calif., LB $11,373,999, (5 bidders), superstructure, 6,010 ft., San Pedro Terminal Island Toll Bridge over Main Channel, Los Angeles Harbor, Los Angeles Co., CD 2/14/61.

▲ **Steve P. Rados, Inc.**, 112 West Maple Ave., Monrovia, Calif., CA $5,294,195, Proj. 57, Arroyo de La Sacatela STORM DRAIN, Vermont Ave-Beverly Blvd. Area, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 3/10. CD 3/15/61, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles, Bids opened 3/23, ROAD,
Ukropina-Polich-Kral-Ukropina, 201 East Las Tunas Dr., San Gabriel, Calif., LB $6,114,948 (4 bidders) grading, paving to constr. 2.9 mi. 8 lane freeway on Ventura Freeway extension, incl. 14 traffic separation bridges and 1 pedestrian crossing, Los Angeles Co. CD 2/14/61.

▲ **U. S. Steel Corp.**, 120 Montgomery St., San Francisco, Calif., CA $6,180,573, Unit III, 10 mi. welded steel pipe, cement lined and mortar coated elevated section of "Giant M" AQUEDUCT, San Joaquin and Contra Costa Counties, OAKLAND, CALIF. East Bay Municipal Utility Dist., 2130 Adeline St., Oakland, Calif. CD 3/16/61, under LB.

BUILDINGS—LB & CA

▲ **Bettilyon's, Inc.**, 333 S. 2 E. St., Salt Lake City, Utah. LB $3,974,000, (3 bidders), Skyline HIGH SCHOOL, SALT LAKE CITY, UTAH. Granite School Dist., 340 E. 3545 South, Salt Lake City, Utah. BA 3/21. CD 2/10/61.

▲ **Eichler Homes, Inc.**, 2151 St. Francis Drive, Palo Alto, Calif., Owner Builds, $7,000,000, $2,100,000 1st year, 3 years to complete, 72 wood-frame garden APARTMENTS, 13 story, high-rise APARTMENT, with 234 units, rein.-con., COMMERCIAL BLDGS., MARKET, RESTAURANT, SAN FRANCISCO, CALIF. CD 3/23/61.

CANADA

BUILDINGS—BA

▲ **Ont., St. Catharines**—BA 4/14—St. Catharines General Hospital Bd. Governors, 6 story, rein.-con., masonry, brick HOSPITAL WING addn., rein.-con. fdn. $3,500,000. Plans deposit $50. Covan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, 10 Price St., Toronto, archts. Ralph C. Vanning, 7345 Mt. Pleasant Rd., Toronto, engrs. CD 6/22/60.

HEAVY CONSTRUCTION—LB & CA

▲ **Peter Kiewit Sons Co. of Canada, A. Johnson Co. Ltd. & Poole Constr. Co., Ltd.**, 10503 105th St., Edmonton, Alta., CA $8,658,500, supply materials and construct UPSTREAM PORTION of five TUNNELS South Saskatchewan River dam Project near Dunblane, ALBERTA. Prairie Farm Rehabilitation Admin., Motherwell Bldg., Regina, Sask. BA 2/9/61. CD 2/17/61, under LB.

▲ **Perini Pacific Ltd.**, 475 Howe St., Vancouver, B. C., CA $4,674,765, SEWAGE TREATMENT PLANT, Iona Island, VANCOUVER, B. C. Greater Vancouver Sewerage & Drainage Dist., 2294 W. 10th St., Vancouver, B. C. BA 2/7/61, CA 3/22/61. CD 2/17/61, under LB.

U.S. POSSESSIONS

BUILDINGS—BA

▲† **Canal Zone, Gorgas**—BA 6/5—Panama Canal Co., Balboa Heights, 7 story Gorgas HOSPITAL, incl. electrical and mechanical equip. and service; grading, road relocation and road paving; pedestrian over-pass and pedestrian tunnel, etc. $4,200,000. Plans deposit $50. Bid date advanced. Kelly & Gruzen-Helge Westerman, 10 Columbus Circle, New York 19, N. Y., assoc. archts. Dr. Lev. Zetlin, 114 East 32 St., New York 16, N. Y., structural engr. Joseph R. Loring & Assocs., 25 West 45 St., New York 36, N. Y., mechanical engrs. CD 3/7/61.

AMERICANS ABROAD

BUILDINGS—LB & CA

▲ **M. W. Kellogg Co. with subsidiaries Kellogg International Corp., London, England and Kellogg of Panama**, 711 3 Ave., New York 17, N. Y., U. S. A., CA design and construct FERTILIZER PROJECT, incl. ammonia plant, area unit, nitric acid plant, ammonium nitrate plant and nitro limestone plant, BARRA A BARRA, PORTUGAL. Uniao Fabril do Azoto, Lisbon, Portugal. C & I/Girdler International Ltd., engrs., Nassau, Bahmas will design nitric acid, ammonium, nitrate plant and limestone plant.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Senegal, Dakar**—BA 6/1—Direction du Port de Commerce de Dakar, DREDGING port of Dakar. $2,500,000.

▲ **Iraq**—BA 6/3—Director General of Planning & Designs, Ministry of Municipalities, Baghdad, WATER PIPE LINE and constr. of CONCRETE FENCES for Qala't Dizza Water Supply Scheme, Sulaimaniya Province. Plans deposit $28.

▲ **Hong Kong, Victoria**—Bids Asked—Controller of Stores, Govt. Stores Dpt., 249 Electric Rd., North Point, Hong Kong, REFUSE DESTRUCTOR or INCINERATOR.

▲ **Tunisia**—Bids Asked—Secretariat of State of Agriculture of the Republic of Tunisia, Tunis, DAM INTAKE and OUTLET, SPILLWAY and SEALING RESERVOIR BASIN Sidi Messaoud Dam on the Qued Nebana, 62 mi. south of Tunis and 30 mi. north of Kairouan. Interested firms register by Apr. 20, 1961. Time Extended. CD 1/3/61.

BUILDINGS—BA

▲ **Iran**—Bids Asked—Sherkat Sahami Siman Tehran (Tehran Cement Co.), 540 Ave., Shah, Tehran, CEMENT MANUFACTURING PLANT with daily capacity of 600 metric tons Portland cement.

PROPOSED PROJECTS

WATER SUPPLY

▲† **Colorado**—Ute Water Conservancy Dist., P.O. Box 462, Grand Junction, water supply to bring water from Big Creek and Cottonwood Creek Reservoirs on Grand Mesa, vicinity of Grand Junction. $11,500,000. Western Engineers, Grand Junction, Colo., engrs. First schedule Fall 1961.

BRIDGES

▲ **Fla., Miami** — Dade Co. Bd. Comrs., 10th Floor, Courthouse, BRIDGE and APPROACHES, Mainland to Dodge Island, Port of Miami. $3,000,000. Ewin Engineering Corp. of Florida, DuPont Plaza Center, consult. engrs. Bids June 1961.

▲ **Pa., McKeesport**—City, City Hall, 2 RAILROAD BRIDGES, APPROACHES over Youghiogheny River, $5,644,000. To go ahead in 1963.

STREETS AND ROADS

▲ **OHIO**—Dpt. Hys., State Depts. Bldg., Columbus, Zone 15, ROAD,
Tuscarawas Co.—Interstate Rte. 77, 9 mi. from Dover-New Philadelphia Bypass north to Canton corporation line. $12,500,000. Beiswenger & Hoch, 1006 Grant St., Akron, consult. engrs. CD 12/5/60.

▲ **PENNSYLVANIA**—Pa. Turnpike Comn., Box 531, Harrisburg, ROAD,
Cumberland, Franklin, Huntingdon, Bedford, Somerset and Westmoreland Counties—resurface, repair, Pennsylvania Turnpike from Carlisle westward. $20,000,000. Michael Baker Jr., Inc., Rochester, consult. engr. R. A. Farley, c/o owner, engr. CD 10/28/53.

UNCLASSIFIED

▲ **Indiana**—Indiana & Michigan Electric Co., 2101 Soy Run Ave., Fort Wayne, 186 mi. 345,000 volt TRANSMISSION LINES, SUBSTATIONS from Tanners Creek Station. $12,000,000. American Electric Power Services Corp., 2 Broadway, New York 8, N. Y., consult. engrs.

▲ **Pa., Phila.**—Dpt. Procurement, City Hall Annex, Broad St. SUBWAY EXTENSION, Snyder to Patterson Ave. $17,000,000. **Kuljian Corp.**, 1200 North Broad St., Phila. 21, Pa., and DeLeuw Cather & Co., 150 N. Wacker Dr., Chicago, Ill., consult. engrs. CD 9/23/58.

▲ **Texas, Louisiana, Mississippi, Alabama, Georgia, South Carolina and North Carolina**—Dixie LPG Pipeline Co., (Warren Pet. Corp., Phillips Petroleum Co., Union Texas Natural Gas Co., and Tuloma Gas Products Co.), 800 Enterprise Bldg., Tulsa, Okla., 1,110 mi. 8- to 10-in. PROPANE LINE, Houston area to near Raleigh, N. C. $49,500,000. Service Pipeline Co., 119 E. 6th St., Tulsa, Okla., consult. engrs. Constr. may start in April.

▲ **Washington**—Puget Sound Power & Light Co., White-Henry-Stuart Bldg., Seattle, Zone 1, 131 mi. TRANSMISSION LINE from Wenatchee to Auburn with receiving substation at Auburn, $7,000,000. Stone & Webster Engineering Corp., Lloyd Bldg., Seattle, Zone 1, consult. engrs. CD 4/28/58.

PUBLIC BUILDINGS

▲ **Ala., Montgomery**—State Bureau Prisons, Montgomery, plans by Charles McCauley & Assocs., 1917 5th Ave. S., Birmingham, Maximum Security PRISON, HOSPITAL, Kilby Prison, $10,000,000.

▲ **Calif., Simi**—Simi Valley Unified School Dist., 1725 Deodroa St., $13,403,000 bond election June 6,
7 ELEMENTARY SCHOOLS, $6,083,000;
2 JUNIOR HIGH SCHOOLS, $3,520,000;
1 SENIOR HIGH SCHOOL, $3,800,000.

▲ **Mich., Warren**—Warren Consolidated Schools, bond election June 11, SCHOOLS. $3,500,000. Beyster & Assocs., Inc., 9152 Woodward Ave., Detroit, Zone 2, archt.

▲ **N. Y., Suffern**—Ramapo Central School Dist. 1, Hemion Rd., voted $3,230,000 bonds Mar. 16, three ELEMENTARY SCHOOLS and Hillcrest SCHOOL ADDN. CD 2/17/61.

COMMERCIAL BUILDINGS

▲ **Calif., San Francisco**—Eichler Homes, Inc., c/o Claude Oakland, archt., 109 Stevenson St., 16 story, 160 unit, 15 story, 150 unit, 13 story, 234 unit, rein.-con. High Rise APARTMENTS, Western Addn. Redevelopment Area, $6,000,000, P. Q. Chin & Hensolt, 121 Second St., consult. engrs.; six 3 story, GARDEN APARTMENTS, Western Addn. Redevelopment Area, $1,000,000.

▲ **Fla., Coral Gables**—Owner, c/o Sidney M. Walker, archt., 311 Lincoln Rd., Miami Beach, 13 story, bsmnt., CB-S APARTMENT, Biltmore Way and Gardena Ave. $3,000,000. Bliss Engineering Co., 4001 Chase Ave., Miami Beach, structural engr. Henry J. Nelson, 1101 Lincoln Rd., Miami Beach, elec. engr.

▲ **Fla., Miami**—Colonades Corp., Northern Lights Shopping Center, Syracuse, N. Y., plans by Rufus Nims, 2990 Coral Way, COLONADES-CONVENTION CENTER, cottages, motels, swimming pools, Marina, Virginia Key. $4,000,000.

▲ **Ill., Chicago**—Chicago High Rise Corp., c/o Ralph W. Applegate Co., 208 S. LaSalle St., Zone 4, 34 story APARTMENT, parking, Michigan and Grand Aves. $8,000,000.

▲ **Ill., Chicago**—McCormick Willoughby Co., 77 W. Washington St., plans by Perkins & Will, 309 W. Jackson Blvd., Zone 6, 10 story OFFICE, Washington St. and Wacker Dr. $10,000,000.

▲ **N. Y., Cheektowaga**—Peter Santin Constr. Co., 3685 Harlem Rd., Cheektowaga, and **Kidd-Knott Constr. Co.**, 1368 Sycamore St., Buffalo, 660 HOMES, George Urban Blvd. and Dock Rd. $12,000,000. Nussbaumer, Clarke & Velzy, Inc., 327 Franklin St., Buffalo, consult. engr. CD 6/6/60.

▲ **N. C., Rocky Mount**—R. D. Gorham, Jr., 1004 Cokey Rd., plans by Toombs, Amisano & Wells, 70 Fairlie St., N.W., Atlanta, Ga., 300,000 sq. ft. SHOPPING CENTER. $3,000,000. Bids in Spring. CD 3/13/61.

▲ **O., Dayton**—Stratford House, Inc., c/o Sol Friedman, 4247 Catalpa Dr., 11 story, precast concrete MOTOR HOTEL, 330-334 W. 1st St. $3,250,000. (Correction—project location.) CD 3/10/61, under O., Lorain.

▲ **O., Lithopolis**—Forbes Co., 2244 Mock Rd., Reynoldsburg, 300 HOMES, Lithopolis Rd. and Rte. 674, $6,500,000.

▲ **Va., Richmond**—Church Development Corp., 1103 E. Main, plans by H. D. Nottingham & Assocs., Arlington Towers, Arlington, three 9 story APARTMENTS. $10,000,000. CD 10/12/60.

INDUSTRIAL BUILDINGS

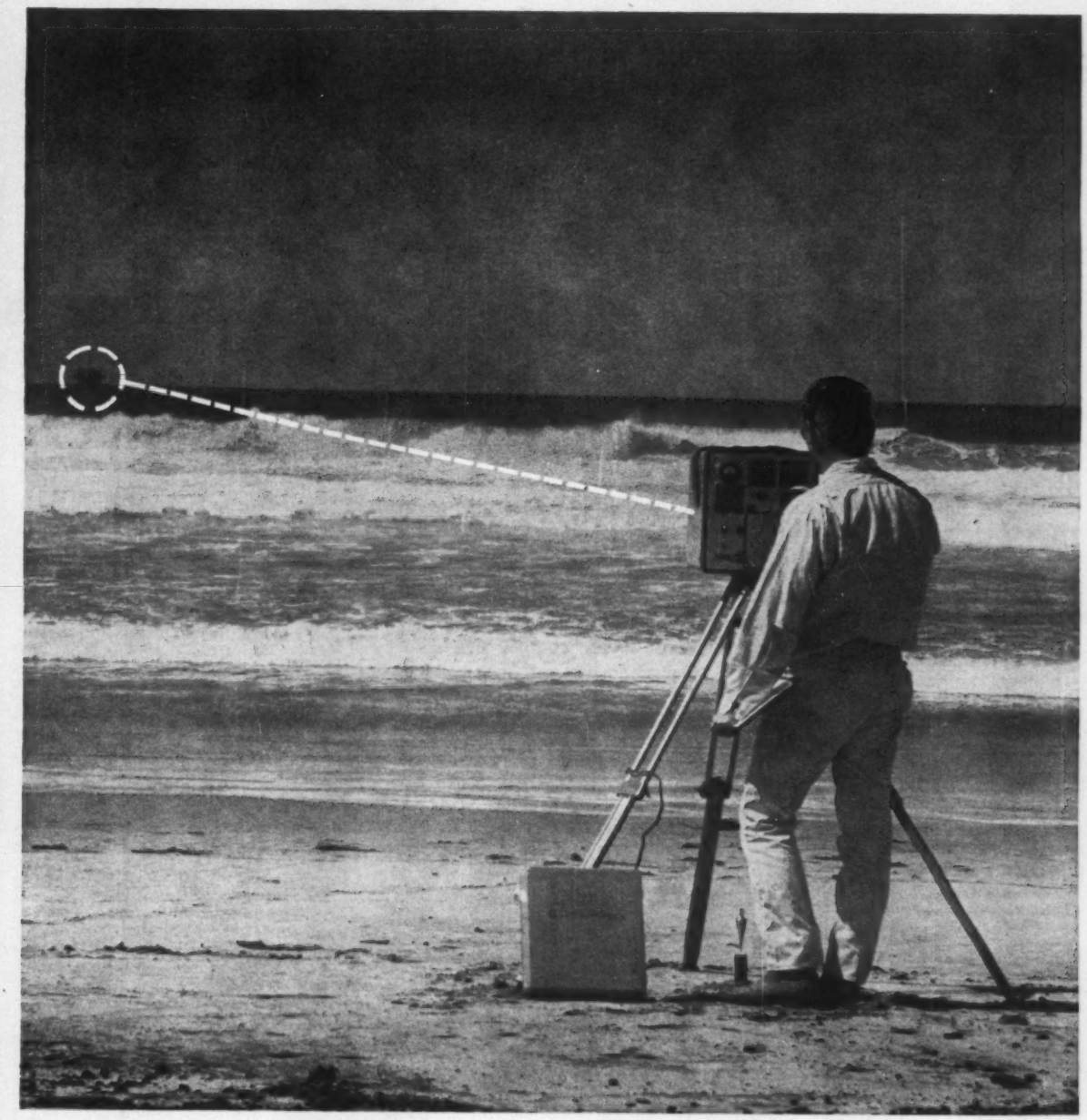
▲ **Ga., Atlanta** — Southern Cement Div., American Marietta Co., Protective Life Bldg., Birmingham, Ala., 1,500,000 bbl. annual capacity Portland Cement PLANT, near here, $18,000,000. Bids Summer 1961.

▲ **Ill., Chicago**—Bulk Terminals, Inc., 120 S. LaSalle St., Chicago, Zone 3, TERMINAL STORAGE TANKS, Lake Calumet Harbor. $10,000,000. Bids in Spring 1961.

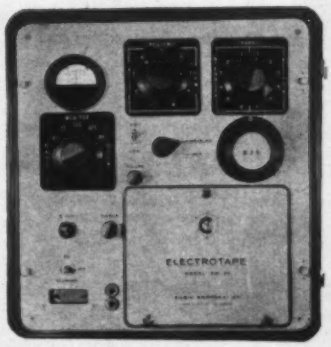
▲ **La., Baton Rouge**—W. R. Grace & Co., 7 Hanover Sq., New York 5, N. Y., POLYETHYLENE PLANT ADDN. $5,000,000. Flour Corp. Ltd., 2500 South Atlantic Ave., Los Angeles, Calif., consult. engrs. CD 12/22/60.

▲ **N. Y., Ravena**—Cerro Corp. and Newmont Mining Corp., 300 Park Ave., New York, Zone 22, CEMENT MILL. $64,000,000.

(Proposal Advertisements see pp. 71 to 73)



Cubic DM-20 Electrotape system quickly pinpoints location of off-shore installation.

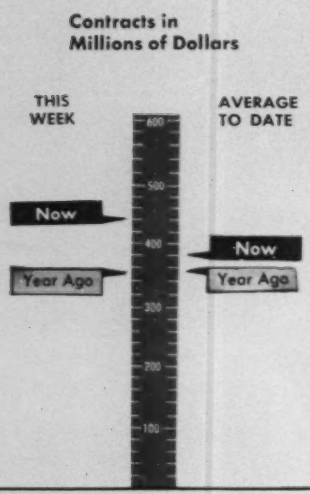


ELECTROTAPE WORKS WHERE CHAIN AND TAPE WON'T: The new, lightweight, all-transistorized version of Cubic Electrotape, Model DM-20, marks a major breakthrough in the art of surveying. Electrotape eliminates time-consuming chain and tape work, and lets even unskilled operators measure distances from 150 feet to 40 miles in just a few minutes per set-up. Easily operable by one man, the DM-20 weighs only 25 pounds. Its accuracy is 1 centimeter plus 3 parts per million, and the front panel readout is directly in centimeters, eliminating scope or meter interpretations. The DM-20 operates day and night, in any weather, with a built-in radio-telephone permitting communication between operators at all times. A single tripod-mounted unit incorporates the recessed parabolic antenna, regulated power supply, compact battery, and electronic circuits. Write for descriptive literature to Dept. ENR-101, Industrial Division, Cubic Corporation, San Diego 11, California.

cubic
CORPORATION
INDUSTRIAL DIVISION
SAN DIEGO 11, CALIFORNIA

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

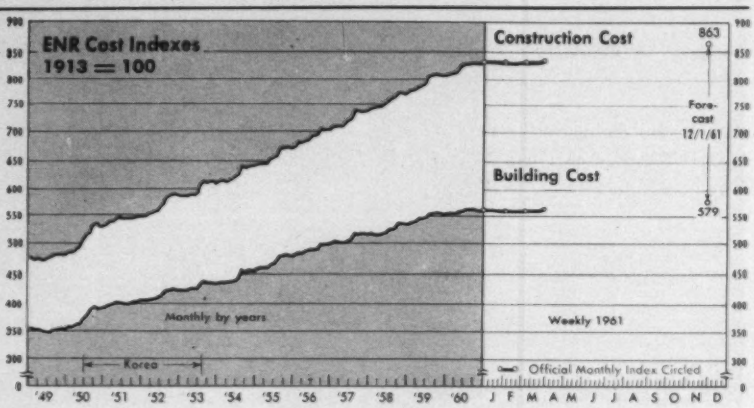
Contracts Awarded In 50 States By Type	This Week millions	Cum. 14 wks 1961	Chge '60-'61 %
All Heavy Construction	$440.0	$5,372.5	+ 7
By Ownership			
PRIVATE	169.6	2,685.0	+ 1
PUBLIC	270.4	2,687.5	+13
State & Municipal	233.2	2,056.4	+16
Federal	37.2	631.1	+ 5
By Type of Work			
PUBLIC			
Waterworks	20.0	107.4	+34
Sewerage	20.3	183.9	+28
Bridges*	13.9	139.6	−47
Highways	109.4	927.7	+36
Earthwork, Dams & Waterways	15.9	177.5	+ 4
Buildings:			
Excl. Housing	42.0	643.6	+17
Housing	18.7	179.5	+44
Unclassified	30.3	328.5	− 8
PRIVATE			
Buildings:			
Mass Housing	100.1	1,196.5	− 2
Commercial	42.4	556.6	− 1
Industrial	21.5	816.5	+40
Unclassified	5.5	115.2	−60

*Includes Private bridges

NOTE Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

NEW CONSTRUCTION CAPITAL

	Week of Mar. 30 millions	Cum. 13 wks 1961	Chge '60-'61 %
Corporate Securities	$ 27.3	$ 415.9	−37
State and Municipal:			
All Except Housing	97.5	1,684.1	−0.2
Housing	3.0	22.2	+63
Federal Loans	0.3	49.6	+ 3
Federal Aid	0	0	0
Total Nonfederal	$128.0	$2,171.8	−10
Federal Appropriations:			
Projects in U. S.	0	0	0
Outside U. S.	0	0	0
Total New Capital	$128.0	$2,171.8	−10


ENR Cost Indexes 1913 = 100
Construction Cost
863
Forecast 12/1/61
Building Cost
579
Monthly by years
Weekly 1961
Korea
Official Monthly Index Circled
'49 '50 '51 '52 '53 '54 '55 '56 '57 '58 '59 '60
J F M A M J J A S O N D

ENR INDEXES (1913=100), 20-cities' average	Week of Mar. 30 1961	% Change from Mar. 2 1961	% Change from Mar. 31 1960
Construction Cost	837.58*	+0.4	+2.9
Building Cost	565.19*	+0.4	+1.8

* Official Monthly Index for April

To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850.
1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

This Month . . .

WAGE RATES, 20-cities' average	Apr. 1961	% Change from Mar. 1961	% Change from Apr. 1960
Common	$2.775	+0.4	+4.9
Skilled (average 3 trades)	4.133	+0.3	+4.4
Bricklayers	4.342	+0.1	+3.7
Structural Ironworkers	4.193	+0.6	+4.9
Carpenters	3.844	+0.2	+4.7
Equipment operators (average three types)	3.760	+0.3	+4.5
MATERIAL PRICES, 20-cities' average			
Structural Steel (average 3 mills), per cwt	5.50	0	0
Lumber, 2x4 Fir, per M fbm	117.35	+1.5	−3.2
Lumber, 2x4 Pine, per M fbm	109.07	+0.5	−0.8
Cement, bulk, per bbl	4.04	0	+0.7
Sand, per ton	2.340	0	−5.2
Ready-mixed concrete, per cu yd	14.25	0	−0.4
Gypsum sheathing, ½"x2'x8', per Msf*	62.25	−0.6	−1.6
Fiber board sheathing, ½" sq. ed., per Msf*	70.66	0	−3.9
Mineral wool insulation, 3' batts, per Msf*	67.66	−0.2	−1.4
Crushed stone, 1½", per ton, CL	2.708	+0.2	+1.4
Concrete blocks, sand/gravel, 8"x8"x16", each*	0.2263	0	−2.8

Latest Month . . .

	Mar. 1961	Feb. 1961	Mar. 1960
Brick, common per M	41.15	+2.7	+1.1
Lime, hydrated finishing, per ton, CL	39.88	0	+1.2
Structural clay tile, 3x12x12", per M, 2,000 up*	192.05	+1.3	+2.0
Vitrified clay sewer pipe, std 12", per ft	1.413	+0.3	−1.4
Concrete sewer pipe, 12", per ft	1.422	0	+2.2

* Delivered, trucklots

ENR INDEX REVIEW

	Construction Cost		Building Cost		Volume	
1960	1913=100	1949=100	1913=100	1949=100	1913=100	1949=100
Mar.	813.26	170.48	555.16	157.81	533	154
Apr.	814.78	170.80	555.98	158.04	695	201
May	822.58	172.44	559.57	159.06	610	176
June	826.64	173.29	561.02	159.48	784	227
July	829.33	173.85	562.63	159.93	682	197
Aug	830.18	174.03	562.17	159.80	631	182
Sept.	830.92	174.19	562.79	159.98	603	174
Oct.	829.58	173.90	561.45	159.60	591	171
Nov.	830.09	174.01	561.11	159.50	609	176
Dec.	830.61	174.12	561.50	159.61	503	145
1960 Average	823.55	172.64	559.43	159.02	597	172
1961						
Jan.	834.32	174.90	562.91	160.01	557	161
Feb.	834.27	174.89	562.93	160.02	464	134
Mar.	834.16	174.87	562.89	160.01	519	150
Apr.	837.58	175.59	565.19	160.66	...	...

JFK's housing bill spells out . . .

A Massive Aid Plan for Cities

All signs point to fast congressional action on President Kennedy's housing recommendations. Mr. Kennedy sketched out his program generally in a housing message earlier this month; last week he sent to Congress his specific requests in a 36-page "Housing Act of 1961."

The proposals mark a new turn in government aid to home construction. The policy, which would be backed by billions in new mortgage insurance authority and billions in urban renewal, is directed mainly toward urban housing and urban rehabilitation.

There is a request to authorize Federal Housing Administration insurance to cover 40-year mortgages on low-priced housing—something that's available now only to families displaced by urban renewal and other government actions. This would be a temporary experiment that would expire in July, 1963.

Except for this provision, President Kennedy's program concentrates on stimulating urban renewal on a much more flexible basis, rehabilitation of existing houses in urban areas, special insurance and grant programs for housing for the elderly, and special programs for cooperative and rental housing.

Sen. John Sparkman (D., Ala.) opens hearings this week on the President's program and a score of other housing bills.

Mr. Kennedy's proposed program is an all-inclusive package carrying a large, but largely undetermined ultimate price tag. Here's what it calls for:

• **Moderate-income families:** Besides single-family housing, the no-down payment, 40-year mortgage would be available to two-, three-, and four-family units.

• **Home improvement and rehabilitation:** For the first time FHA mortgage insurance would be available on loans up to $10,000 over 25 years for rehabilitating existing housing at an interest rate ceiling of 6%. Regular home improvement loans now have a $3,500 ceiling, a five-year maximum term, and a permissible effective interest rate of more than 9%.

• **Housing for elderly:** Another $50 million in loan funds requested, raising the total ante to $100 million.

• **Public housing:** A $10-million grant fund for localities to experiment with different types of public housing. Authorization is asked for an additional 100,000 public housing units.

• **Urban renewal:** A $2.5-billion authorization for grants and a higher ceiling on relocation payments. Authorization is asked to allow urban renewal sites to be sold to limited-dividend nonprofit, or public body for rental housing. Buildings in urban renewal areas rehabilitated as demonstration projects could be sold to private owners. Up to 30% of urban renewal funds could be devoted to non-residential areas, instead of the 20% maximum under present law. The federal share of urban-planning costs would be raised from one-half to two-thirds. Total authorization would be raised to $100 million, from $20 million.

• **Community facilities:** Boost authorization another $50 million.

• **FHA insurance authority:** Extend the agency's authority to insure for another four years, without specifying any dollar maximum.

• **Federal National Mortgage Association:** Increase its funds for special assistance programs by $750 million.

One of the key programs is aimed at accelerating improvement of properties located in urban renewal areas.

But the rehabilitation of existing properties as a policy of government is not new; this concept was born with the Housing Act of 1954. Section 220, which provides FHA-insured mortgages to finance property rehabilitation, was written to implement the idea.

The Administration proposal, however, calls for a program of insured—and for all practical purposes—second mortgages. Should a borrower default, the mortgage would be paid off, then the FHA would follow through on recovering the amount defaulted.

The improvement loans could be made on mortgaged properties, but the amount of the loan could not exceed $10,000 per family unit or the estimated cost of improvement, whichever is less. It would also be limited to an amount that, added to any outstanding indebtedness on the property, would keep total indebtedness within limits applicable to a Section 220 mortgage.

Key to the hoped-for success of the new program is the apparent lack of red tape and, more important, the absence of financial hurdles that have so far prevented the 220 program from becoming a roaring success. Except in the relatively few cases where a property is free of all indebtedness, the Section 220 rehabilitation mortgage is essentially the refinancing of an existing mortgage.

Refinancing is generally expensive. In many cases, the interest rate on the refinanced mortgage will be higher than that on one several years old. The average property owner is not inclined to refinance a mortgage at higher interest rates when his old one is well along to maturity.

Germany Tells Contractors: 'Whoa'

While President Kennedy hopes to heat up the U.S. economy by stimulating public and private construction, West Germany wants to damper its white-hot boom by clamping the lid on construction starts for three to five months. The construction-ban, which will be sought from Parliament shortly, would apply to schools, hospitals, commercial buildings and factories. Only highways, waterways, military projects and government-sponsored housing would be excluded from the order.

The proposal, spear-headed by the Ministry of Housing, may also be politically inspired in this election year. The Bonn government is committed to supporting construction of at least 550,000 living units yearly, but that goal may not be attained. Housing Minister Paul Lueckes believes that construction workers in labor-short West Germany are drained from housing construction to industrial and commercial construction. A moratorium on industrial and commercial work would release workers for housing.

Construction industry spokesmen oppose the move. They argue the construction industry can't be singled out as the major cause of inflationary dangers, and therefore be controlled. They also contend that labor and equipment used on industrial jobs can not be wholly utilized for housing construction. The ban would therefore idle machinery and labor that could not be used to build housing.

Interest in Tollroads Stirs Again

The scheduled bond offering for the Massachusetts Turnpike underscores activity in five other states

Bonds to finance the 11.7-mile extension of the Massachusetts Turnpike from its present terminus at Weston into Boston will be sold next week. The $175-million offering underlines the continued interest in tollroad construction still apparent in other parts of the nation.

Kentucky, Delaware, Florida, Oklahoma and Virginia are all involved in plans for new tollroads.

Kentucky recently sold $39 million worth of bonds for a toll highway in the eastern part of the state from Winchester to Compton. And Gov. Bert T. Combs also selected one of two recommended routes for a tollroad in western Kentucky. A preliminary study by Brighton Engineering Co. of Frankfort, calls for a 120-mile road from Elizabethtown, the terminus of the Kentucky Turnpike, to Princeton. Cost of this toll highway is estimated at $70 million.

In Florida, Gov. Farris Bryant is reviving the long-stalled extension of Florida's Sunshine State Parkway. A lot more mileage has been added, however. Earlier plans called for construction of a 97-mile extension to Orlando from the existing road's terminus at Fort Pierce. Now plans call for a 225-mile extension from Fort Pierce to Baldwin, about 19 miles west of Jacksonville.

The extension to Orlando came close to being financed last year, but the commitment to underwriters was cancelled after the incumbent governor, LeRoy Collins, decided the incoming Governor Bryant should make the decision. He has now decided that the bonds should be sold by negotiation instead of competitive bidding. This will also involve refinancing the outstanding debt of the Miami-Fort Pierce section, which amounts to about $66 million. Another $109 million would go for construction of the tollroad all the way to Baldwin. It is possible, however, that the length of this extension may be scaled down to the original version—97 miles to Orlando. If so, new-construction outlays would drop to about $55 million.

Cropping up for the second time this year in the Delaware legislature is a proposal authorizing establishment of a turnpike authority to build tollroads and river and bay crossings. Immediate objective of the proposal, however, is construction of a $140-million tollroad to connect the Delaware Memorial Bridge near Wilmington with the Baltimore Tunnel. This would be a cooperative effort. Maryland already has enacted legislation authorizing such a tollroad venture.

Virginia's Gov. J. Lindsay Almond, Jr. has recommended to Virginia Highway Commissioner H. H. Harris that the state cooperate in building a toll turnpike along the Delmarva Peninsula from Cape Charles to the Delaware Memorial Bridge. Nothing concrete has yet developed.

In Oklahoma, the state supreme court removed one of the obstacles to expansion of that state's tollroad system by approving issuance of $90 million in bonds for construction of the Southwestern and Eastern turnpikes (ENR Oct. 6, 1960, p. 96).

Principal issue before the court was the plan to create a $1-million-a-year trust fund from taxes on gasoline bought on the turnpike system. The fund would help underwrite the bonds. The trust fund cannot exceed $4 million prior to construction and is limited to three years' interest after the bonds are sold.

Still remaining is a hurdle that could effectively block sale of the bonds: The court held there is nothing in the law guaranteeing that future legislatures must maintain the same motor fuel tax or the same apportionment of the collections. Lacking a guarantee that any new bonds sold would not have their financial foundation disturbed, investors probably would avoid the bonds.

A New Record, but an Old Story

Building and construction costs are at record highs this month, according to ENR's 20-cities cost indexes. Several deferred wage increases for construction workers and a dramatic reversal of a lengthy down-trend in lumber prices shoves ENR's Construction Cost Index to 837.58 and the Building Cost Index to 565.19. Both indexes are based on average building and construction costs in 1913 as 100.

Common laborers on both building and heavy construction projects got deferred wage hikes of 2½ cents an hour in Baltimore and 12½ cents in Kansas City on April 1. Heavy construction laborers got a deferred increase of 10 cents an hour in Boston. Bricklayers and carpenters in Kansas City got deferred 12½-cent-an-hour raises on April 1. Structural ironworkers' rates went up 12½ cents an hour in Baltimore and Kansas City, 10 cents in Denver and 16 cents an hour in Seattle.

As ENR predicted (ENR Mar. 23, p. 59) the 18-month-long lumber price slide came to an end; prices surged higher this month. Douglas fir 2x4s jumped $2 to $8 per Mbf in six of the 20 major U.S. construction centers covered by the ENR indexes. Southern pine 2x4s moved $4 to $5 per Mbf higher in two cities. The vigorous advance in fir prices reflected a much improved order situation at West Coast mills. In the past month, unfilled mill orders rose 21% while mill inventory dipped 1%.

In the weeks just ahead, labor developments will dominate the cost picture. Contracts have now expired for common laborers, bricklayers and construction equipment operators in Denver and structural ironworkers in Dallas. Next month, contracts run out for all construction trades in Cleveland, and for common laborers, carpenters and equipment operators in Philadelphia. The outcome of new contract negotiations in these cities will have a profound effect on bargaining sessions during May and June, the year's busiest negotiating period.

Construction Put in Place Up Seasonally in March

The value of total new construction put in place in March rose seasonally to $3.9 billion, up 8% over February, according to estimates of the Department of Commerce's Bureau of the Census. This brings first-quarter estimates to $11.3 billion, about equal to last year.

Private construction expenditures of $2.8 billion rose 7%, slightly more than normal, while public outlays of $1.1 billion rose 10%. The latter rise is slightly less than the usual increase that takes place between February and March.

Spending for private non-farm housing in March rose 10% to $1.4 billion. Usual seasonal increase is 9%. For the first quarter, estimated private construction of $1.8 billion was 5% below 1960, offsetting the 14% increase in public works expenditures of $3.2 billion.

Kennedy's Loss Is Labor's Gain

Proposed changes in minimum wage bill give union construction workers more than they asked for

President Kennedy's first big legislative defeat may give the AFL-CIO building trades unions a dividend they did not expect. They may get more help than they asked for in their fight against nonunion contractors.

It was the drubbing administered to the Kennedy minimum wage bill in the House that has prompted Sen. Pat McNamara (D., Mich.) to draft a substitute bill for the Senate. The Administration hopes the McNamara proposals will eventually lead to a House-Senate compromise that preserves the President's major objectives—a $1.25 minimum wage and broader coverage. Senator McNamara, a member of the plumbers' union, is considered a friend of organized labor.

Although McNamara's bill is narrower than the legislation turned down in the House, it will have a broader impact on the construction industry. It would help protect union wage standards by extending the coverage of the Fair Labor Standards Act to construction establishments in interstate commerce that do at least $350,000 worth of business a year.

Contrary to popular belief, the relatively high level of construction wages has not made the minimum wage an academic issue for construction people. The fact that the bill would require contractors to pay overtime at the rate of time-and-a-half after 40 hours to nearly one million additional workers makes it a bread-and-butter issue for the building trades unions—not because it would add to the pay envelopes of their members but because it would dull the edge of nonunion competition that threatens both their jobs and their wage standards.

Unlike the House bill, the McNamara measure applies the gross volume test for contractors to a parent company as well as to individual operating units or establishments, thus sweeping the latter under the law if the over-all establishment grosses $350,000 a year.

The newly covered workers in these firms would be protected by a gradual increase in the minimum wage to $1.25 by 1964 and would receive the law's overtime protection in installments, getting full protection based on a 40-hour week by 1964.

The bill (S. 1457) was introduced in the Senate last week. It is a substitute for S. 895, the Senate version of the House-defeated Administration bill. Hearings will not be held on the new bill. It is scheduled for consideration and probable approval by the full Senate Labor Committee in an executive session on April 11.

For tactical purposes, the McNamara bill exempts small units within retail chains from the law's application. This was the major issue in the defeat of the Administration's original proposal. Those who drafted the new bill hope the change will make possible final approval of a fairly broad, $1.25 minimum wage bill.

Senator McNamara's office had no data list last week on the probable impact of the new bill on contractors. But it is estimated that close to a million construction workers would have been newly covered under the narrower Roosevelt bill and that a somewhat larger number would benefit from the McNamara bill. Most of these would benefit from the overtime rather than the minimum wage protection.

New Plan Bars Strikes at Fair

Construction management and labor in New York City, and various groups with which they are allied, are making every effort to see that the 1964-65 New York World's Fair gets off to a good start.

In a "declaration of purposes and principles" agreed to last month, they promised that the multimillion-dollar construction program for the fair will not be hit by lockouts, strikes, picketing or other interference that could impede construction progress.

Voluntary machinery has been established for the peaceful and orderly settlement of labor disputes that may arise. An advisory committee representing labor and management has been set up to assure adherence to the no-strike plan and procedures. The plan applies to all construction work for the fair, including work both on and off the site.

Under the plan, disputes covering wages, hours or working conditions, and disputes relating to the application or interpretation of existing labor agreements, must be mediated or arbitrated under existing grievance machinery. If there is no such machinery, or if the parties elect not to use it, the disputes go to the chairman of the advisory committee for final and binding arbitration.

Special provisions are made for jurisdictional disputes and for disputes of any other character—but the terminal point in each case is binding arbitration if no solutions are reached in the intermediate steps.

The groups that adopted the plan are the Building Trades Employers' Association, General Contractors Association, Building Contractors Employers' Association, and Building and Construction Trades Council of Greater New York, AFL-CIO. Chairman of the advisory committee is Peter W. Eller, former chairman of the BTEA.

Participants in the plan estimate that construction costs at the site of the fair will range between $500 million and $600 million, and that an additional $100 million will be spent on related projects, including the widening and extension of roadways and expressways leading to the fair.

Open Shop Competition Hurts Canadian Group

The 163-member Masonry Contractors Association in Toronto, Ont., claims that its members are being squeezed to financial ruin by falling profits and rising wage costs.

Association vice president Leonard Eden has predicted that two-thirds of the members will go out of business unless something is done soon.

In the background is the fact that association members signed a labor contract with a local of the bricklayers union last summer. Mr. Eden said that since the signing of the agreement, 19 contractors have gone bankrupt, 60% of the association members are idle and none of them can continue paying union rates.

Contractors, he added, face the prospect of breaking the union contract and being sued—or going into bankruptcy.

Mr. Eden said that 56 competitors are using nonunion bricklayers and union men who work for less than union wages.

Labor in Brief . . .

• **A. D. Lewis reelected** – The United Mine Workers' District 50, at a special convention held in Washington, D.C., last month, unanimously reelected A. D. ("Denny") Lewis as president, Elwood Moffett as vice president and John J. Badoud as secretary-treasurer.

• **Boilermaker elected**–William A. Calvin, international president of the boilermakers union, has been elected a vice president and Executive Council member of the AFL-CIO.

• **Pay raises**–Deferred wage increases ranging from 5 to 20 cents an hour are scheduled for 90,000 Chicago construction workers between now and July 1. The increases are expected to nudge construction costs up by about 2%. Raises are due under long-term contracts.

• **Preferential hiring**–Delaware Gov. Elbert N. Carvel has reminded all state, county and municipal agencies that public works contracts under state law must contain a clause requiring that legal citizens of the state be given preference in employment. The reminder was prompted by rising unemployment.

• **Right to work**–An agency shop clause in a labor contract is unconstitutional in Kansas, according to the Kansas Supreme Court. The court ruled that the state's right-to-work provision implicitly forbids forcing nonunion workers to pay a union the equivalent of union dues and fees as a condition of employment.

• **School for safety**–The AFL-CIO has opened the first National Safety Training Institute in labor's history. Purpose is to train trade unionists in safety and occupational health. Certificates of completion will be given those who attend four sessions –one each calendar quarter. Those who complete the course are expected to train their fellow members.

• **Sounding boards**–The National Society of Professional Engineers has urged Congress to pass the Kearns Bill (H. R. 412), which declares that nonbargaining organizations of professional personnel are not "labor organizations." Object is to protect engineering sounding boards, whose members include supervisory personnel, from the charge of being illegal, company-dominated labor organizations.

Union Demands Shorter Workweek

Contractors in California are already facing a union demand for a shorter workweek without loss of pay.

In opening collective bargaining negotiations for a new master labor contract, the Carpenters District Council of Los Angeles has requested a 32-hour workweek with the same gross pay. This would automatically jump the carpenters' pay scale by $.956 an hour to $4.78. Current scale is $3.825 for a 40-hour week.

Affected contractor groups called the demand "completely unrealistic" and potentially dangerous to all building construction. Among the Los Angeles groups that have condemned the demand are the following: Building Contractors Association of California, the Associated General Contractors, the Home Builders Association, and the Engineering and Grading Contractors Association.

A spokesman for BCA said acceptance of the demand would add from $1,500 to $2,000 to the cost of tract homes and would further price new homes out of the market. He predicted that it would also cut all types of construction, including school construction, by as much as 50%.

The carpenters have taken the position that mounting unemployment–which has been running at the rate of 15 to 20% for California carpenters–has made the demand necessary. A shorter workweek would give more men a crack at available jobs.

Although President Kennedy recently expressed his opposition to a shortened workweek as an answer to the economic problem, the idea of something less than a 40-hour workweek has been gaining increasing support in labor circles. It is being talked about by labor officials in the steel, auto and maritime industries, for example, as a means of bolstering purchasing power and providing jobs for a larger number of workers.

OFFICIAL PROPOSALS

Bids: May 16, 1961

Dade County Port Authority

ADVERTISEMENT FOR PRE-QUALIFICATION OF PRIME CONTRACT AND SUB CONTRACT BIDDERS ON THE CONSTRUCTION OF MAJOR JET OVERHAUL FACILITIES FOR EASTERN AIR LINES, INC., TO BE CONSTRUCTED BY THE DADE COUNTY PORT AUTHORITY, AT MIAMI INTERNATIONAL AIRPORT, MIAMI, DADE COUNTY, FLORIDA.

PRE-QUALIFICATION OF BIDDERS

Pursuant to Resolution No. 6389, adopted by the Board of County Commissioners of Dade County, Florida, acting as the Dade County Port Authority, at its regular meeting of March 21, 1961, every contractor desiring to tender proposals on one or more divisions of the work for the Major Jet Overhaul Facilities for Eastern Air Lines, Inc., to be constructed by the Dade County Port Authority at Miami International Airport, Miami, Dade County, Florida, must submit a statement of experience and financial condition, on the form prescribed, for use by the Authority in investigating and determining the qualifications of bidders, and must be approved by the Authority as qualified to undertake, perform and complete said work **before being eligible to receive drawings and specifications for bidding or for contract award.**

All questions contained in the prescribed form must be answered, and the data must be clear and comprehensive. The statement must be notarized and delivered to the Clerk of the Board of County Commissioners, Room 1616, Dade County Courthouse, Miami, Florida, or mailed to the Clerk of the Board of County Commissioners, Post Office Box 3510, Miami, Florida, and received by him on or before 2:00 P.M., E.S.T., Tuesday, May 16th, 1961.

Contractors shall submit a separate statement for each division of the work on which they desire to tender a proposal.

CERTIFICATE OF COMPETENCY

The requirements for pre-qualification of bidders are in addition to the provisions of Chapter 10, Code of Metropolitan Dade County, which require all persons, firms or corporations desiring to engage in the contracting or sub-contracting business in the construction field in Dade County, to possess a Certificate of Competency from the appropriate Metropolitan Dade County Examining Board.

DESCRIPTION OF PROJECT AND DIVISIONS OF WORK

The project, for which plans and specifications are now being prepared, will consist, in general, of the following:

1. SITE UTILITIES AND LAND IMPROVEMENTS, including underground piping mains, electrical distribution systems, concrete aprons and bituminous pavements; also the removal of certain existing structures.
2. ENGINE OVERHAUL SHOP (approximately 200,000 sq. ft.) with adjacent Components Test Area.
3. TWO (2) JET ENGINE TEST CELLS, including control room and equipment and service areas.
4. SERVICE FACILITIES BUILDING (approximately 12,000 sq. ft.), housing boilers, air compressors, refrigeration compressors, fire pump, electrical equipment, distillation equipment; includes Tank Farm.
5. HANGAR BUILDING (approximately 90,000 sq. ft.) with adjacent 3-story structure housing shops, offices, and storage areas (approximately 50,000 sq. ft. per floor).
6. INDUSTRIAL WASTE TREATMENT PLANT, to be converted from existing Sewage Treatment Plant.

Separate bids will be taken on each of the following divisions of work at a time or times, in a manner and under the terms and conditions as the Dade County Port Authority shall prescribe:

(Continued on page 71)

OFFICIAL PROPOSALS

(Continued from page 70)

DIVISION A. STRUCTURAL STEEL—furnishing, fabrication and erection of the structural frame of the Engine Overhaul Shop, the Service Facilities Building, and the Hangar Building; also Pipe Trestles.

This division of the work will be let under separate prime contract.

DIVISION B. ARCHITECTURAL TRADES—general construction of the entire project, including Land Improvements.

The successful bidder on this division of the work will be required to assume, under a single General Contract, all of the other divisions of the work (except Structural Steel) hereinafter enumerated.

DIVISION C. CRANES, MONORAILS, HOISTS—providing coverage of the entire Overhaul Shop and the Hangar Building.

DIVISION D. MECHANICAL TRADES—including site mains as well as installations in all buildings (except in Service Facilities Building) of domestic water supply, stormwater, sanitary and industrial wastes, compressed air and Varsol, jet-engine fuel, steam and chilled water services; also services and connections to process and test equipment.

DIVISION E. VENTILATING AND AIR CONDITIONING—all air handling equipment and duct distribution systems in Engine Overhaul Shop, Jet-Engine Test Cells and Hangar Building.

DIVISION F. FIRE PROTECTION—including deep-well pumps, site mains, and building systems consisting of CO_2, deluge, and standard automatic sprinkler systems.

DIVISION G. PIPING AND EQUIPMENT—in the Service Facilities Building and Tank Farm, including boilers and associated equipment, air compressors, refrigeration compressors, cooling tower, Varsol distillation; also all building mechanical installations.

DIVISION H. ELECTRICAL WORK—including primary incoming service, switchgear, and underground site distribution; secondary power, lighting and signal systems; distribution and installation for the entire project; also service and connections to process and test equipment.

Qualification forms will be available during office hours at the office of the Engineer, Dade County Port Authority, Terminal Building, Miami International Airport, Miami, Florida, and may be obtained there or by written application directed to the Engineer at 59-2075 A.M.F. Branch, Miami 59, Florida.

The Dade County Port Authority reserves the right to secure additional information, or to verify the information from any source available to them in determining the qualifications of the Contractor.

The Dade County Port Authority reserves the right to waive any informalities and to reject any and all applications for qualification.

DADE COUNTY PORT AUTHORITY
DADE COUNTY, FLORIDA
BY: E. B. LEATHERMN,
Clerk of the Circuit Court
BY: EDWARD D. PHELAN
Deputy Clerk

Bids: June 15, 1961

Wapda Tender Notice

The West Pakistan Water & Power Development Authority invites tenders for the excavation work of Pat Feeder (Gudu Barrage) from reputable earthwork contracting firms. The total quantity of earthwork to be done is approximately 870 million cubic feet and two years will be allowed for this work from the date of arrival of the machinery on site. Earnest Money required will be Rs. 180,000 (or equivalent foreign exchange).

Tender documents, plan and specifications for the work can be had either from the Project Director or from the following: (1) Resident Representative, West Pakistan WAPDA, Ebrahim Court, 2, West Wharf Road, Karachi; (2) Director Works, West Pakistan WAPDA, The Pipals, Lower Mall Lahore.

The last date for the receipt of tenders is 15th June, 1961. Tenders unaccompanied by Earnest Money will not be entertained. Tenders will be opened by the undersigned in the presence of such contractors who chose to be present on 15th June, 1961.

The bidders will have to keep their bid open for 120 days from the date of the opening of the tenders.

The West Pakistan Water and Power Development Authority reserves the right to accept or reject any tender without assigning any reason therefor.

PROJECT DIRECTOR,
GUDU BARRAGE PROJECT
SUKKUR.

Bids: April 13, 1961

New York State Roadwork

NOTICE TO CONTRACTORS

STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of Highway Law, sealed proposals will be received until 10:30 a.m., Eastern Standard Time, on April 13, 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for:

SOIL EXPLORATIONS AND FOUNDATION INVESTIGATIONS AT VARIOUS SITES ON INTERSTATE ROUTE 505, SIZER STREET TO JEFFERSON STREET, NEW PROJECT NUMBER 1-81-2(25)83, OLD PROJECT NUMBER 1-1127(11), ONONDAGA COUNTY, WHICH CONSTITUTES CONTRACT SPEC. NO. FA-SM-182.

Maps, plans and specifications may be examined and obtained at the following offices:

(a) Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany 1, New York.
(b) Mr. Earl E. Towlson, District Engineer, New York State Department of Public Works, 333 East Washington Street, Syracuse, New York.
(c) Mr. William Mende, Principal Building Construction Engineer, Department of Public Works, 270 Broadway, New York City.

The deposit for a set of plans, specifications and proposal forms is $5.00. Refunds of deposits for plans, specifications and proposals will be made only in case the deposits of individual sets are $10.00 or more, per Chapter 835, Laws of 1960.

The Engineer's Estimate of cost for this work is $15,565.00.

Proposal for this contract must be submitted in separate sealed envelope with the name of the contract plainly endorsed on the outside of the envelope. Proposal must be accompanied by draft or certified check, payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum of $1,000.00. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law as set forth in "Instruction to Bidders."

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPERINTENDENT OF
PUBLIC WORKS

Bids: April 24, 1961

Borough of Camp Hill, Pa.

Sealed proposals will be received by the Borough of Camp Hill, Cumberland County, Penna., at the office of the Borough Secretary, in the Municipal Building, 2201 Market Street, Camp Hill, Penna., until 7:30 P.M., Eastern Standard Time, April 24, 1961, and will be publicly opened and read shortly thereafter, for furnishing all necessary labor, materials and equipment, and performing all work required for the separate Contracts noted below. Each proposal shall be accompanied by a certified check or a bid bond in an amount not less than ten (10) percent of the total bid, in accordance with the provisions of the Specifications.

Copies of the Contract Documents, including Drawings and Specifications, not to exceed two (2) sets of any particular Contract to a prospective bidder, may be obtained *only* from the office of Gannett Fleming Corddry & Carpenter, Inc., Engineers, 600 North Second Street, Harrisburg, Pennsylvania, upon deposit of the following indicated amounts for each set. *Checks presented as deposit for Contract Documents shall be made payable to Gannett Fleming Corddry & Carpenter, Inc.*

CONTRACT ONE
CONSTRUCTION OF EXTENSIONS TO TO SEWERAGE SYSTEM, $40.00

(Part A) Consisting of all sewers south of Routes 11 and 15 tributary to Athol Street Pumping Station, and all sewers discharging directly to existing sewerage system at 19th and 21st Street; also includes force main from Athol Street Pumping Station to new Manhole 42 on 19th Street.

(Part B) Consisting of all sewers north of Routes 11 and 15 tributary to Manhole 44 on Creek Road from the East.

(Part C) Consisting of all sewers north of Routes 11 and 15 tributary to Creek Road Pumping Station from the west; also includes force main from Creek Road Pumping Station to an existing manhole just west of existing Borough Park Pumping Station, and force main from existing Borough Park Pumping Station to an existing manhole on 25th Street.

CONTRACT TWO
CONSTRUCTION OF PUMPING STATIONS, $30.00
CONTRACT THREE
ELECTRICAL WORK IN CONNECTION WITH CONSTRUCTION OF PUMPING STATIONS, $30.00

Full refund will be made to actual bidders only for return of one (1) set, no more, of a particular Contract in good condition within fifteen (15) calendar days after opening of bids; refund for return of all other sets in good condition within the same period will be fifty (50) percent of deposit; no refund will be made for Contract Documents returned later.

BOROUGH OF CAMP HILL
Gannett Fleming Corddry and
Carpenter, Inc., Engineers

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-5564) will be received at Denver, Colorado, until 2 p.m., Mountain Standard Time, May 4, 1961, for furnishing thirty-three (33), 230-, 161-, 69-, and 15-kv, 1,200- and 600- ampere, 3-pole, m-g-o- disconnecting and interrupter switches; and five (5) 15-kv, disconnecting fuses for Sioux City Substation (044), Missouri River Basin Project. Delivery is desired within 220 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

Bids: April 25, 1961

City of Littleton, Colorado

SECTION I
NOTICE TO BIDDERS

Sealed proposals for the construction of two (2) five million gallon (5.0 mg) covered water reservoirs for the City of Littleton, Colorado will be received at the office of the Director of Public Works, City Hall, 2450 W. Main St., Littleton, Colorado, until 10:00 a.m., M.S.T., April 25, 1961. All bids will be publicly opened and read aloud in the presence of bidders or their duly authorized representatives in the City Council Chambers, City Hall, Littleton, Colorado. Bids received later than this hour and date will be returned unopened. Proposals shall be submitted in duplicate.

Copies of the Plans, Specifications and Proposal Forms can be obtained at the office of the Director of Public Works, City Hall, 2450 W. Main St., Littleton, Colorado, upon payment of Twenty Dollars ($20.00) for each set. Any bidder, upon returning such set in good condition within ten (10) days after the opening of the Proposals, will be refunded this same amount.

Bids will be taken on two (2) types of water reservoirs. The extent of the work is as follows:

Proposal No. 1
Two (2) five million gallon (5.0 mg) Prestressed Concrete Water Reservoirs, 174 ft. in diameter x 28 ft. high. Work shall include site preparation, extension of an 18 inch steel pipe to the reservoir and the furnishing and installation of reservoirs.

Proposal No. 2
Two (2) five million gallon (5.0 mg) Steel Reservoirs, 164.5 ft. in diameter x 32 ft. high. Work shall include site preparation, extension of an 18 inch steel pipe to the reservoir and the construction of an all steel reservoir, including foundation and painting.

All bids must be accompanied by a certified check payable to the City of Littleton in the amount of at least five percent (5%) of the bid. This check is to be drawn on a bank which is a member of the Federal Reserve System. A bidder's bond in a like amount will also be acceptable. The check or bond will be retained by the City of Littleton as liquidated damages if the successful bidder refuses or fails to enter into a contract and performance bond in accordance with his bid when notified of the award.

The City of Littleton reserves the right to waive any informalities in, or to reject any or all Proposals, or portions thereof.

Robert M. Ryan
Director of Public Works

OFFICIAL PROPOSALS

Bids: April 27, 1961

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, CANAL LAW, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time, on the 27th day of April 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

OFFICIAL PROPOSALS

OFFICIAL PROPOSALS

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. FULLER, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Rte. 85)	FAC 61-6 FARC 61-25	City of Albany: Crosstown Rte. Art. Highway, (Krumkill Rd. to Washington Ave.) Slingerlands-Albany, S.H. 5237 Proj. U-392(12)	1.96 (4.59 Acc.)	9" Cem. Conc. Pavt., 2 @ 24' Var.= 1.41 Mi. Grad., Drain., Misc. Work = 0.55 Mi., Acc.= 1.91 Mi. Cem. Conc. Pavt., 2.11 Mi. Asph. Conc. Ty. 1A & 0.57 Mi. Grad., Drain., & Misc. Work, H.G.S. I-Beam, 4 Sps., 193.5' Tot., H.G.S. Twin Comp. I-Beam 3 Sps. Ea., 142.02' Tot., 4 H.G.S. Comp. I-Beam, 4 Sps. 187.70' Tot., 5 Sps. 250.81' Tot., 5 Sps. 396.49' Tot., 2 Sps. 139.35' Tot.	$275,000 Plans $10	$5,037,000
DISTRICT No. 2, L. KETCHUM, District Engineer, 109 No. Genesee St., Utica 1, N. Y.						
Herkimer (Rte. 8S)	R.C. 61-49	Stone House-Indian Castle, S.H. 8417; Little Falls-Montgomery Co. Line, S.H. 831	3.19	Asphalt Conc., Type 1A	$7,100 Plans $5	129,000
Madison (Rte. 13)	FARC 61-56	New Woodstock-Cazenovia, S.H. 8024, Cazenovia Vill. Pt. 1, S.H. 5675, Cazenovia Vill. Pt. 1, S.H. 5675 Proj. S-54(2), F-470(20)	5.25	Asphalt Conc. Ty. 1A = 5.23 Mi. Misc. Work = 0.02 Mi.	$45,000 Plans $5	815,000
Oneida, Herkimer, & Madison (Rtes. 274, 12C, 28, & 46)	R.C. 61-43	Holland Patent-Frenchville, Pt. 1, S.H. 1545; Whitesboro-Trenton, S.H. 5325; Herkimer-Middleville, S.H. 460; Middleville Vill. S.H. 869, Oneida-Munnsville, Pt. 2, S.H. 1217	.....	Tree Removal	$500 Plans $5	9,000
DISTRICT No. 3, E. E. TOWLSON, District Engineer, 333 E. Washington Street, Syracuse, New York						
Cayuga (Rte. 34)	FARC 61-53	Fleming-Scipio, Pt. 2, S.H. 1327; Fleming-Scipio, S.H. 753 Poplar Ridge-Fleming, S.H. 5244; Fleming-Auburn, S.H. 5012; Fleming-Auburn, S.H. 5012 Proj. F-1155(2), S-673(2)	6.86	Asphalt Conc.= Ty. 1A	$55,000 Plans $5	990,000
Cayuga (Rte. 38)	R.C. 61-42	Victory-North Victory, S.H. 8407	4.06	Asphalt Conc., Type 1A	$12,000 Plans $5	219,000
Onondaga (Rte. 31)	FARC 61-58	Weedsport-Jordan, Pt. 2, S.H. 5630; Jordan Vill.: No. Main St. S.H. 1505; Jordan-Baldwinsville, Pt. 1, S.H. 1506 Proj. F-185(6)	4.15	Asphalt Conc. Type 1A; Twin Reinf. Conc. Closed Box Br. 38.1' Sp., Twin Reinf. Conc. Open Box Br. 27.3' Sp.	$50,000 Plans $5	916,000
Oswego (Rte. 3)	R.C. 61-48	Mexico-Selkirk State Park, Pts. 1 & 2, S.H. 8458; Port Ontario-Jefferson Co. Line, S.H. 8420	14.78	Asphalt Conc. Type 1A	$40,000 Plans $5	709,000
DISTRICT No. 4, B. F. PERRY, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Monroe (Rte. 47 & Int. Trg. Rte. 490)	FITS 61-12 FATS 61-13	Interstate Rte. Conn. 580 (FISH 56-9 & FISH 58-16) Rochester-Bushnell Basin, Pt. 2 & 3; Rochester Outer Loop (FASH 58-17, FAC 59-8, FASH 59-14) (East Ave. to Winton Rd.) Winton Rd.-Sea Breeze, Pt. 2 (FASH 56-7) Proj. I-490-2(24), U-1097(7)	4.75	Traffic Signs and Delineators	$16,000 Plans $5	112,000
Monroe	M 61-4A	City of Rochester: Sector Gate 2, Court St. Dam on Genesee River	....	Cleaning & Painting Sector Gate 2	$350 Plans $5	6,600
Monroe	LOSP 61-1P FAC 61-8P	Lake Ontario State Parkway (Dewey Ave.-Rochester City Line), Rochester City: Lake Ontario State Parkway Art. Highway, (Rochester City Line—Lake Ave.) Proj. U-1141(3)	1.76 (0.93 Acc.)	Asphalt Conc.= 2.61 Mi.; Misc. Work = 0.08	$30,000 Plans $5	545,000
Ontario (Rte. 21)	FARC 61-55	Bristol, S.H. 187; Cheshire-McJannetts Hill, S.H. 639 Proj. S-387(2)	2.51	Asphalt Concrete	$11,700 Plans $5	213,000
Wyoming (Rte. 19)	FARC 61-63	Warsaw-Gainesville, S.H. 5400 Proj. F-380(8)	0.09	Asphalt Conc.= 0.07 Mi.; Misc. Work = 0.02 Mi.; Prestressed Conc. Beam Br. 53' Sp.	$13,000 Plans $5	228,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, State Office Bldg., 65 Court Street, Buffalo 2, New York						
Chautauqua (Rte. 17)	FAC 61-10	City of Jamestown: North-South Art. Highway, (Washington St.-Fluvanna Ave.) Proj. U-861(4)	1.89	Asphalt Conc. Type 2A	$56,000 Plans $5	983,000
Chautauqua (Rte. 60)	FARC 61-62	Pratt Corner-Sinclairville, S.H. 1471 Proj. F-1117(3)	0.66	Asphalt Conc.= 0.63 Mi.; Misc. Work = 0.03 Mi.; Triple Reinf. Conc. Closed Box, 3 Sps. 85.16' Tot.	$24,000 Plans $5	443,000
Erie & Niagara	M 61-5	Webster St. Bridge E 248 Over Erie Canal; Tonawanda to N. Tonawanda	....	Cleaning and Painting Twin Bascule Bridge	$600 No Plans 2 Proposals $2	11,500
Erie (Rte. 75)	R.C. 61-45	Athol Springs-Hamburg, S.H. 1067	1.83	Asphalt Conc.= 1.82; Misc. Work = 0.01	$10,000 Plans $5	187,000
Erie (Int. Trg. Rte. 290)	PIPLE 61-1	Interstate Rte. Conn. 590 Powerline Expressway Sect. 2, Contract 1, (Millersport Highway to Main St.) Proj. I-290-1(41)	3.34 (6.50 Acc.)	9" Cem. Conc. Pavt. 2 @ 36' Var.= 3.14 Mi.; Misc. Work = 0.20 Mi.; Acc.= 4.18 Mi. Cem. Conc. Pavt.; 2.17 Mi. Asph. Conc.; 0.15 Mi. Misc. work; 3 HGS Comp. I-Beam; 3 Sps. 181.22' Tot.; 4 Sps. 316.7' Tot.; 4 Sps. 226.68' Tot.; HGS—Plate Girder, 2 Sps. 214.53' Tot.	$400,000 Plans $10	7,356,000
Erie (Rte. 5)	FATS 61-10	Lake Shore Lackawanna City, S.H. 5019; Athol Springs-Walden Cliffs, S.H. 5407 Proj. U-750(24)	1.32 (1.10 Acc.)	Traffic Signs & Delineators	$750 Plans $5	13,000
Erie (Rte. 5)	R.C. 61-44	Southwestern Boulevard, Pt. 9, S.H. 1852	2.02	Asphalt Concrete	$12,000 Plans $5	218,000
Niagara (Rte. 425)	R.C. 61-61	North Tonawanda-Shawnee, S.H. 713; Shawnee-Cambria, S.H. 729	6.06	Asphalt Concrete Type 1A	$43,000 Plans $5	790,000
DISTRICT No. 7, R. W. SWEET, District Engineer, 444 Van Duzee Street, Watertown, New York						
Clinton (Rte. 22)	R.C. 61-38	Plattsburg-Mooers, Pt. 1, S.H. 138; Plattsburg-Mooers, Pt. 3, S.H. 260	7.69	Asphalt Concrete Type 1A	$20,000 Plans $5	364,000
Clinton (Rte. 348)	R.C. 61-39	Rouses Point Village, S.H. 5228, Rouses Point-Canadian Line, S.H. 5337	2.34	Asphalt Concrete Type 1A	$7,000 Plans $5	125,000
Clinton (Rte. 9B)	R.C. 61-40	Chazy-Rouses Point, S.H. 5199	3.58	Asphalt Concrete Type 1A	$11,500 Plans $5	214,000
Clinton (Rte. 191)	R.C. 61-41	Altona-Obers Corners, S.H. 1488	0.49	Asphalt Concrete Type 1A	$5,000 Plans $5	90,000
St. Lawrence, U.S. Grenville, Canada	OBA 61-7	Ogdensburg Bridge; Canadian & U. S. Approaches	2.40	Traffic Signs	U. S. $1,300 Plans $5	U. S. 23,000
Lewis (Rte. 26)	R.C. 61-47	Ava-West Leyden Pt. 2; West Leyden-Constableville Pt. 1, S.H. 8305; Constableville-Lyons Falls, Pt. 1, S.H. 1600	3.44	Asphalt Concrete Type 1A	$9,000 Plans $5	152,000
DISTRICT No. 8, K. G. RAUER, District Engineer, Pleasant Valley Rd., Poughkeepsie, New York						
Dutchess	FAC 61-11	North-South Arterial Highway City of Poughkeepsie Proj. U-322(20)	2.30	Demolition	$11,000 Plans $5	193,000
Orange	FAC 61-7	City of Newburgh: South Street Arterial Highway Proj. U-843(10)	1.88	Asphalt Concrete = 1.88 Mi.; H.G.S.-1 Span-Reinf. Conc. Rigid Frame—68.7'	$70,000 Plans $5	1,280,000
DISTRICT No. 9, J. C. FREDERICK, District Engineer, 71 Frederick Street, Binghamton, New York						
Broome (Rte. 26)	R.C. 61-50	Whitney Point Village-Hickory St., S.H. 1612; Whitney Point-Upper Lisle, S.H. 858; Upper Lisle-Willet, Pt. 1, S.H. 9034	2.73	Asphalt Concrete	$7,000 Plans $5	121,000
Delaware	BWS 61-1	City of New York Board of Water Supply, Road No. 1 (Cannonsville Reservoir) City of New York; Board of Water Supply, Road No. 2 (Cannonsville Reservoir)	7.07 (1.89 Acc.)	Asphalt Conc.= 8.23 Mi. Grad., Drain., Temp. Conns. = 0.73 Mi.; Twin Reinf. Conc. Closed Box Br. 34.15' Sp.; Triple Reinf. Conc. Closed Box Br. 27.1' Sp.	$200,000 Plans $5	3,638,000
Delaware (Rte. 10)	R.C. 61-51	Hobart-Stamford, S.H. 952	4.65	Asphalt Concrete	$17,000 Plans $5	302,000
Otsego (Rte. 28)	R.C. 61-59	Richfield Springs-Schuyler Lake, S.H. 5037; Richfield Springs-Schuyler Lake, Pt. 2, S.H. 5659; Schuyler Lake-Cooperstown, Pt. 1, S.H. 5686	6.62	Asphalt Concrete	$20,000 Plans $5	360,000
Schoharie (Rte. 10)	R.C. 61-52	Stamford-Summit, S.H. 8201	8.28	Asphalt Concrete	$27,000 Plans $5	482,000
Sullivan, N. Y. Wayne, Pa.	I. BR 61-1	Callicoon Interstate Bridge	0.72 (0.16 Acc.)	Asphalt Conc. Type 1A; Welded Plate Gird. Br., 7 Sps. 135.4' Each	$55,000 Plans $5	967,000

(Continued on page 73)

OFFICIAL PROPOSALS

OFFICIAL PROPOSALS

(Continued from page 72)

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 10, A. M. Sarr, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx (Int. Trg. Rte. 278)	FIBETS 61-1	Interstate Rte. Conn. 516 Bruckner Expressway (Sect. 1, Contract 5,) St. Ann's Ave. to East 135th St. Proj. I-278-1(62)	0.29	Traffic Signs and Delineators	$2,700 Plans $5	50,000
Kings	BP 61-63	Beach Protection at Coney Island	....	Artificial Beach Nourishment	$50,000 Plans $5	875,000
Nassau (Rtes. 25, 106, 107)	FATS 61-11	Massapequa-Glen Cove, S.H. 9017; Jericho-Oyster Bay, S.H. 9021; Jericho Turnpike, S.H. 9020; Jericho Turnpike-Plainview Rd., S.H. 436 Proj. US-377(7), US-500(5), U-1000(11)	3.08	Traffic Signs and Delineators	$7,000 Plans $5	130,000
Queens (Int. Trg. Rte. 78)	FICE 61-1 FAVWE 61-1	Interstate Rte. Conn. 513 Clearview Expressway (Hillside Ave. to 73rd Ave.) Van Wyck Expressway Extension (57th Avenue to Union Turnpike) Project EI-78-1(61), U-1085(19)	3.83 (7.81 Acc.)	9" Cem. Conc. Pavt. = 3.10 Mi.; Colored Cem. Conc. Pavt. = 2.36 Mi.; Asph. Concrete = 1.19 Mi.; Misc. Work = 0.22 Mi.; Embankment and Surcharge = 4.77 Mi., HGS Plate Gird. 124' ≈ Sp.; 2 HGS Comp. Beam 1 Sp. 83' ≈, 2 Sps. 122' ≈ Tot.; 1 Equestrian Underpass Overpass-Simple Beam, 2 Sps. 69' ≈ Ea.; HGS—4 Level Structure Plate Girder, 4 Sps. 415' Tot.; WF Beam 4 Sps. 282' Tot.; Plate Girder 2 Sps. 248' Tot.	$675,000 Plans $10	12,589,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal-Aid Highway Act of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bond shall conform to the provisions of the Highway Laws, as set forth in "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: April 25, 1961

Monroe County Sewer Agency

Sealed bids for the construction of Sanitary Sewers, Section E-3, and the construction of Administration and Maintenance Buildings-Section FF, for the Gates-Chili-Ogden Sewer District, will be received by the Monroe County Sewer Agency, at its office at 307 Terminal Building, 65 Broad Street, Rochester 14, New York, until 11 a.m., E.S.T. on the 25th day of April, 1961.

Bidding forms can be obtained and plans and specifications examined at the office of the Monroe County Sewer Agency, or at the office of The Lozier Company, Engineers, 10 Gibbs Street, Rochester, New York.

Copies of plans and specifications for Section E-3 may be obtained upon the payment of twenty-five dollars ($25.00).

Copies of plans and specifications for Section FF may be obtained upon the payment of fifteen dollars ($15.00).

The full amount charged will be returned to all bidders who return the complete plans and specifications in an acceptable condition within thirty (30) days from the date of award to the successful contractor. Half of the amount charged will be returned to non-bidders who return the complete plans and specifications in an acceptable condition within thirty (30) days from the date of award to the successful contractor. Checks or money orders should be made payable to the order of Gordon A. Howe, Monroe County Director of Finance.

The work consists of the construction of:

SECTION "E-3" — Approximately 17.0 miles of Sanitary Sewer, 8 inch to 24 inch diameter, with all appurtenances.

SECTION "FF"—Buildings for Administration and Maintenance of the Sewer District. Contracts for GENERAL, PLUMBING, HEATING AND VENTILATING, AND ELECTRICAL will be awarded separately.

COUNTY OF MONROE
By: C. A. Bennett,
Purchasing Agent

Bids: See Advertisement

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract NYA-340.005—New York International Airport—Central Heating and Refrigeration Plant—Expansion—Foundation for Five Cell Cooling Tower—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, April 20, 1961.

Contract NYA-120.013—New York International Airport—Foundations and Piping for Eight Fuel Tanks (Nos. 53 to 60)—Deposit $50.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, May 4, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitted a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, April 6, 1961

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5563) will be received at Lewiston, California, until 2 p.m., Pacific Standard Time, May 9, 1961, for furnishing labor and materials for Spring Creek Debris Dam, Trinity River Division, Central Valley Project, California. Location near Redding, California, in Shasta County. Principal items are Excavation 2,050,000 cu. yds.; embankment 1,800,000 cu. yds.; Concrete 10,500 cu. yds.; and other work. Completion time 760 days. For particulars, address Bureau of Reclamation, P. O. Box 247, Lewiston, California; P. O. Box 2511, Sacramento, California; or Building 53, Denver Federal Center, Denver 25; Colorado. Floyd E. Dominy, Commissioner.

OFFICIAL PROPOSAL

RATE $2.70 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a. m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Class. Adv. Div.; Engineering News-Record, P. O. Box 12, New York 36, N. Y.

EMPLOYMENT OPPORTUNITIES

• POSITIONS VACANT

Soils Engineer. Graduate Civil Engineer with field experience in foundation investigation, testing, and laboratory management. Will supervise field exploration and soils laboratory testing for highway construction. Required to analyze field information and test data to develop design criteria and recommend construction technique. Salary, to be negotiated depending on experience. Location, Intermountain West. P-6187, Engineering News-Record.

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Soils Technician with laboratory soils test, field exploration and fill control experience. Must be able to assume responsibility for inspection and supervision of earthwork construction. Send resume including photo and salary requirements. Nevada Testing Laboratories, Ltd. 300 West Boston, Las Vegas, Nevada.

Structural Engineers—Several immediate openings with New York City Consultant for graduate engineers preferably with experience in bridge design. Submit resume and salary expected. P-6379, Engineering News-Record.

Senior Civil Engineer (Design) — Salary $9030 to $10,860. Open to New York State residents. Requires New York State Professional Engineer's license and two years of professional civil engineering experience in the design of bridges or related structures. For details write Recruitment Unit, Box 90C, New York State Department of Civil Service, State Campus, Albany 1, N. Y.

Sales Engineer for Preload Tanks-3 to 5 years experience selling to water works industry and cities in Southwest, Rocky Mountain, or Northwest. Age under 40. Reply with resume only. The Preload Company, Inc., 355 Lexington Avenue, N. Y. 17, N. Y.

SALES ENGINEER

Well-established Eastern company seeks sales engineer for heavy machinery. Experience in Cement, Lime, Material Reduction and Conveying fields preferred. Must be free to travel. Liberal company benefits. Send resume with salary requirements to

SW-6478—Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

(Continued on following page)

City of St. John's, Newfoundland

Applications are invited for the following positions:

CIVIL ENGINEER

Graduate Civil Engineer, to prepare designs and estimates, write specifications, supervise layout and construction of streets, water and sewer mains, and other municipal services.

TRAFFIC ENGINEER

Graduate Civil Engineer with a post-graduate course at a recognized Traffic School. To conduct traffic studies, analyses, and prepare reports thereon. Should have experience in Traffic Engineering field and a knowledge of geometric road design. The successful applicant would be in charge of Traffic Division of City Engineer's Department.

Applicants should submit complete details of education and professional experience, or enquire for additional information regarding the position to the City Engineer, City Hall, St. John's, Newfoundland.

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The advertising rate is $45.20 per inch for all advertising appearing on other than a contract basis. Frequency rates quoted on request.

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Subject to Agency Commission.

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Position Wanted ads take ½ of above rate.

Box numbers—count as 1 line.

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Send NEW Ads and Inquiries to Classified Advertising Division of ENGINEERING NEWS-RECORD, P. O. Box 12, N. Y. 36.

• POSITIONS VACANT
(Continued from preceding page)

Structural Engineer—MS or PhD to conduct design and experimental studies of a variety of structures. Challenging and varied problems involving the application of high strength and constructional alloy steels. Experience not required but applicant should have a thorough understanding of structural behavior. Large research laboratory. Western, Pennsylvania. Submit resume and salary requirements to P-6309, Engineering News-Record.

Engineer—Water Works—10 years experience in planning installation of pumps, wells, etc. Permanent employment with water works management company. Location—Philadelphia, Pa. Reply P-6357, Engineering News-Record.

Experienced sewer and water superintendent to be affiliated with established construction company in Illinois. Investment in company necessary. P-6378, Engineering News-Record.

Construction Office Managers—A large southern construction campany has openings for two (2) highly qualified office managers fully experienced in handling lump sum and cost plus multi-million dollar construction contracts. These men must be able to assume full responsibility for all fiscal matters of a field office and be willing to relocate periodically as required. Excellent salary and company benefits. Permanent position. Maximum age, 40. Send a complete resume and a recent photograph. P-6362, Engineering News-Record.

Structural steel detailers and checkers, growing company, permanent work. P-6401, Engineering News-Record.

Assistant Town Engineer for small, but fast growing, New England town (pop. 7,500). College not required but preferred. Salary range $4,800. to $5,300. annually. Send resume to P-6419, Engineering News-Record.

Wanted—Concrete Foreman: Good labor boss to handle concrete crew on 7 months, 25,000 yard concrete job. Call Bill Fitzpatrick, BAker 5-2252 or write M. S. Kelliher Co., Inc., 20 Euclid Street, Rochester, N. Y.

Construction Manager or General Superintendent. Civil engineer, registered in Pennsylvania. Twenty-five (25) years experience in general construction field including estimating, negotiating of subcontracts, submitting of proposals, purchasing, layout and organizing, scheduling and supervising of projects. Will relocate. Salary $10,000.00. P-6470, Engineering News-Record.

• POSITIONS VACANT

Waterworks Superintendent. The City of Rhinelander, Wisconsin is accepting applications for the position of Water and Sewer Superintendent. Letters of application indicating experience, qualifications, training, references, and salary requirements shall be addressed to the Director of Public Works, Rhinelander, Wisconsin.

Overseas Position: Water supply, planning and design engineer. Consultant to advise Peruvian Inter-Ministerial Committee of highly qualified sanitary and hydraulic engineers in the development of a national water supply plan for Peru. Must be well qualified in broad planning aspects of small and medium-sized city water systems with particular emphasis on design and financing, as well as administration of large country plan. Must be able to work on high policy level. Headquarters: Lima, Peru. Salary $10,000 to $14,000 (dependent on qualifications) plus allowances. Write Box ENR-4, Office of Public Health, International Cooperation Administration, Washington 25, D. C.

Senior Public Health Engineer to direct Division of Sanitation with generalized program in well established County Health Department. Population: 80,182. Vacation cumulative to 25 days, sick leave, retirement, longevity benefits. Salary: open. Must have P.E. in N.Y.S. within 1 year and 5 years of satisfactory sanitary engineering experience. Cattaraugus County Health Department, 302 Laurens Street, Olean, New York. Send application to Dr. Meredith Thompson, 84 Holland Avenue, Albany, N. Y. for approval.

Chief Engineer—Experienced man of mature judgment approximately 45 to 55 yrs. of age to coordinate the design work and exercise general supervision of production activities for a substantial architectural engineering firm in the South. Industrial plants and all allied types of work. Write Box 889, Boston, Mass.

Wanted—Several detailers and/or estimators for rebars, steel joists and similar products. Permanent positions with very well established and growing firm located Central Piedmont Carolinas. State age, education, experience, compensation expected, personal qualifications to P-6444, Engineering News-Record.

New York City Contractor requires a Field Engineer who can do double duty as labor foreman. Experience in both categories required. Permanent position for the right man. Salary, $165.00 per week. P-6455, Engineering News-Record.

Traffic Engineer — $9030-$10,860, N. Y. State. Challenging opportunity for P. E. with one or two years in traffic engineering or highway planning. New York State residence not required. Write Recruitment Unit, Civil Service Dept., Box 86D, State Campus, Albany, New York.

Public Works Director—City of Palm Springs (population 13,500). Salary $862-1048 plus $40 car allowance. California registered Civil Engineer having a minimum of 3 years professional experience. Prefer at least one year in municipal administrative capacity. Apply to Daniel J. Wagner, City Manager, City Hall, Palm Springs.

Village Engineer for a progressive suburban community in Nassau County, long Island, N. Y. Pop. 15,000. Requirements N. Y. State P.E. license, 10 yrs. exp. in highway dept. operations, building code enforcement and city planning. Organizational and administrative ability desirable. Salary to $11,000. Box 373, Hicksville, L. I., N. Y.

• POSITIONS VACANT

Highway Engineers, Draftsmen and Surveyors wanted for permanent employment with consultant engineering firm in the southwest. Send resume of educational background and experience to P-6471, Engineering News-Record.

Engineer Full Time. Masonry background. County & City Engineering Department. Structural code and public relations. Adequate salary. Send full resume. P-6475, Engineering News-Record.

Structural Engineer: Graduation from a four year college or university with major course work in structural engineering plus 3 years experience. Present salary $6448-$7800 per annum. Effective July 1, 1961 $7579-$9100 per annum. Complete details by writing to Director of Personnel, Municipal Building, Hartford, Conn.

• EMPLOYMENT SERVICES

Hundreds of $7,000-$35,000 jobs available. Write for free Report. Strict confidence. National Employment Reports, 20 E. Jackson, 902-B, Chicago 4, Ill.

• POSITIONS WANTED

Civil Engineer, P.E., R.L.S., BSCE, MSCE. Resume upon request. PW-6376, Engineering News-Record.

Estimator-Engineer, 44, BSCE, P.E. 3 states, 15 yrs. experience in construction of multi-million dollar projects, from initial bidding purchasing, office engineering to job completion, incl. customer relations. Desires employment with opportunity with commercial and industrial contractor. PW-6373, Engineering News-Record.

Project Engineer with diversified experience, about 12 years, of Design, Construction-Supervision, Contract Administration. Reports and specifications for bldgs, highways, dams, etc. Specializes in foundation problems and materials laboratory supervision. P. E. Licenses & M.S. degree, 42. Desires responsible position preferably with consulting engineers. Any location. Available this spring at end of overseas assignment. PW-6328, Engineering News-Record.

B.S.C.E. Age 37, 10 yrs experience supervision Power industry also exp highway & bridge engr. Prefer South or Midwest. Desire permanent loc. PW-6312, Engineering News-Record.

B.S.C.E., P.E., 32, 6 years exp. inspection, storm sewers, highways. Desires position West, Southeast. PW-6299, Engineering News-Record.

Construction Engineer. Registered civil. High professional standing. 30 plus years experience all phases water supply, sewage treatment, bridges, tunnels and heavy construction. Available as resident or project engineer to supervise construction of sizeable project for owner, consultant, contractor. PW-6437, Engineering News-Record.

Const. Supt. Age 40 experienced industrial, Commercial, Flood Control work. Prefer far western states. Available now. PW-6436, Engineering News-Record.

Construction Supt. General Construction. PW-4482, Engineering News-Record.

Electrical Construction Superintendent experienced in steam & hydro power stations, industrial plants, substations & distribution systems. Overseas or domestic. PW-6434, Engineering News-Record.

(Continued on page 76)

ELECTRICAL ENGINEER

24 Month Contract on Transmission Lines and Substation Construction in Thailand

Interesting opportunity for graduate Electrical Engineer with a minimum of five years experience on steel tower transmission line and substation construction. To supervise and inspect construction of a 230 KV transmission line and the installation of circuit breakers, shunt reactors, synchronous condenser and protective equipment for 69 and 230 KV substations.

Applicants must pass physical examination and security investigation.

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A successful applicant will be employed as Asst. Chief Electrical Engineer and must have potential to fill the position of Chief Engineer within 3 to 5 years.

Excellent salary, fine benefits including profit sharing and bonus. Send detailed resume including salary requirement. All replies held in strict confidence.

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Electrical engineer with design and construction experience preferably on mining projects.

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P-6409, Engineering News-Record
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McKee is seeking design engineers with a minimum of ten years experience in one or more of the following categories:

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2300 Chester Ave. Cleveland 1, Ohio

An employment advertisement in this EMPLOYMENT OPPORTUNITIES section will help you find the engineers you need. It's an inexpensive, time-saving method of selecting competent personnel for every engineering job.

• POSITIONS WANTED
(Continued from page 74)

Construction Engineer, 38, 12 years field inspection, and supervision for commercial, industrial, hydro-electric and marine construction. Specialized in concrete mix design and control. Some prestressed concrete, soils and piling. Fluent Spanish. Available April 15 for foreign or domestic assignment in field, development or sales. Resume on request. PW-6474, Engineering News-Record.

Project Manager. Complete Administration and supervision incl. negotiations & estimating 24 yrs. hvy. constr. major projects U.S. & O.S. PW-6472, Engineering News-Record.

Surveyor, age 35-14 years experience Highway, Public Utility, Subdivision Design and Layout. Presently self employed. Va. and N.C. Registration. Have instruments, will travel. PW-6465, Engineering News-Record.

Construction Manager-Gen Project Superintendent 25 years experience: roads, bridges, dams, sewage treatment, water systems, sewers, industrial building, tunnels, from bid to completion. Desire position with future. PW-6451, Engineering News-Record.

Const. Supt.-All phases of grading and paving, bridge construction, state and federal projects. Complete job management. PW-6466, Engineering News-Record.

Engineer:-B.S., M.S., RLS (Md. & Va.). 20 yrs. exp. highways, estimates, soils. Seeks job as Field or Layout Engr. or Party Chief. Will accept temporary job. Age 60. $150 per week. PW-6413, Engineering News-Record.

Available-Engineer Executive. Registered Civil and Structural. F. ASCE, NSPE. Mature and well experienced in Owner, Contractor and Public Relations. Also Supervision, including approvals. Prefer medium sized responsible Architectural-Engineering firm. Would like to invest a part of salary in the firm. PW-6467, Engineering News-Record.

Construction Supt. conversant all phases highway projects. Available for travel as liaison & coordinator between home office and field operations or complete charge at site. Will serve per diem anywhere during overload, absence of key man, search for replacement. Phone FR. 9-3976, 78 Rosedale Ave., Freeport, N. Y.

Civil Engineer, BCE, Member ASCE, PE. 10 years varied construction experience. Tired of traveling. Desire permanent & challenging work. Southeast US preferred. PW-6460, Engineering News-Record.

Project Manager, Age 35 with CE degree and 12 years varied field and office management experience with general contractor. Will handle all phases of construction from bid through final payment. PW-6397, Engineering News-Record.

Chief Estimator-Engineer 20 years experience in engineering-construction field. Ten years in estimating, the last six as chief Estimator. Experience primarily in bulding and heavy construction. Desire greater challenge. PW-6440, Engineering News-Record.

Construction Engineer-B.S. in C.E.-9 yrs. experience-supervision and engineering with contractor on heavy construction, also with an industrial corporation, consultant and municipality. Desires challenging position with future. Will relocate. Available immediately. PW-6469, Engineering News-Record.

Graduate, licensed, civil engineer, 36 yrs. old. 3 yrs. in highway construction, 1 yr. in expressway design, 9 yrs in structural design of bldgs, bridges & steam power plant bldgs. Supervisory experience. PW-6462, Engineering News-Record.

M.C.E., age 35, single, N. Y. & Calif. registration, 11 yrs. bridge & bldg. design. Desire interesting European assignment. PW-6463, Engineering News-Record.

Civil Engineer, 35, BCE, PE two states. Experienced field & office engineering, supervision, purchasing for industrial, heavy & hydro construction. PW-6457, Engineering, News-Record.

Master mechanic, 44, married, desires position as heavy equipment superintendent or service manager for contractor or dealer agency. Prefer Central Eastern Illinois location. References. PW-6476, Engineering News-Record.

Field Superintendent-conversant all phases highway construction. Complete job management. PW-6441, Engineering News-Record.

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CLASSIFIED ADVERTISING

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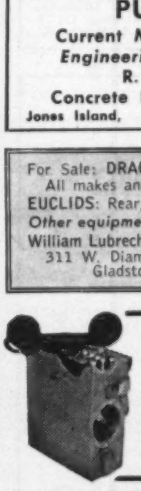

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ENR—T1/3

Emphasis on the Cities

THE PROBLEMS OF THE METROPOLIS are at last beginning to get their due attention. And, at last, those concerned with the various aspects of cities—their planning, housing, transportation, utilities and health—are beginning to get together to think about the whole broad range of problems and how they are related.

Foremost evidence of the new emphasis on cities is the Administration's plan to create a Department of Housing and Urban Affairs in the President's Cabinet.

There is also the emphasis put upon rebuilding city housing through urban renewal in the President's recent housing messages.

There is the new coordination of effort between regional staffs of the Federal Housing Administrator and the Federal Highway Administrator, so that those responsible for rebuilding cities might know the plans of those charged with putting highways in and through them.

There is the fact that hardly a major meeting of the American Society of Civil Engineers passes at which the Highways Division and the City Planning Division do not get together to recognize and discuss their common problems of urban land use.

There is the forthcoming meeting of the American Institute of Architects with urban renewal its theme.

There is the chance—better than ever—that the federal government will do something in a financial way this year to assist planning of urban rapid transit. And there is increased state and federal concern with problems of commuter railroads.

Finally, there was a new kind of coordinated effort late last month in Chicago, a conference bringing together those concerned with environmental control, public health, city planning and public works. It was a Northwestern University conclave of planners, public works officials and consulting engineers, all concerned with the need for teamwork in achieving better living in urban areas.

Everywhere, there seem to be more people thinking about urban problems, more efforts to bring closer cooperation among specialists in the several fields of urban planning and engineering.

And it's high time.

Read Instructions Before . . .

DESIGNERS OF BUILDINGS soon may be offering a new service—the writing of manuals on how to operate and maintain their increasingly complex structures. One tree doesn't make a forest, but one such manual has been written for an Indiana State Office Building.

The building in question (ENR Mar. 30 p. 27) is a $20-million structure in which equipment accounted for about half the investment. Graham, Anderson, Probst and White, Chicago architects-engineers, claim this building will cost $2 per sq ft to operate and maintain each year. It's no job for a janitor, even with the 800-page manual the designers have written.

Industrial buildings and power stations long have been complex affairs in which the structure is but a minor part of the whole; installed equipment makes up the majority of the cost, the complexity. Commercial buildings over the years have become increasingly mechanical: Heating and ventilating, elevators and moving stairs, plumbing and lighting—everything has become more complex.

It takes more than a janitor to run a major building of any type these days. But even the more capable types doing the job for the owners should welcome a set of books on how to do it, written by the designers who chose its materials and equipment. We can see more and more smart architects and engineers offering to do such manuals as an added service to their building-owner clients.

Return to Reason

A MEDAL SHOULD BE STRUCK for the New York State Assembly. Before it adjourned last week it killed a proposal that the new Throgs Neck Bridge in New York City be named the Baron von Steuben Bridge.

Our satisfaction over this turn of events is no reflection on the good Baron, to whom every American owes a debt of gratitude for the training and leadership he gave to our Continental Army during the Revolution. In point of fact he is far more deserving of honors than Giovanni da Verrazano (or is it Verazzano?) who merely sailed into New York Harbor, looked around and sailed out again. And yet Verrazano got his name officially tacked onto America's longest span suspension bridge, now under construction across New York's Narrows.

This peculiar penchant for associating names of historic figures with bridges will, it is hoped, be only a passing fancy. Generally speaking, if a bridge has to be named for a person, he at least should have played an outstanding role in its creation. Otherwise, the best name for a bridge—or a tunnel or a dam, for that matter—usually comes from its neighboring geography.

Golden Gate, Mackinac and Hell Gate, for example, are names that could hardly be improved upon. In fact, there is much to be said for more prosaic names that accurately pinpoint a bridge's location—San Francisco-Oakland, Bronx-Whitestone, Robert Street, Walnut Lane, Michigan Avenue or Philadelphia-Camden.

There are occasions where people's names fit—for example, Rip van Winkle for the Hudson River bridge in the Catskills—but we are glad that no person's name is going to be substituted for Throgs Neck. And we prefer to think of the Narrows Bridge without Verrazano.

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SINGLE DUTY	*DOUBLE DUTY
DRYER 124″ dia. x 44″ long	**DRYER** TWO 100″ dia. x 36′ long units
ELEVATOR 24″ x 10″ AC Buckets @ 12″ centers on X-859 chain	**ELEVATOR** TWO units, with 18″ x 10″ AC buckets on SS-856 chain
SCREEN Two 3⅓ deck—4′ x 14′ assemblies	**SCREEN** TWO 3⅓ deck—5′ x 16′ assemblies
HOT BIN 4 compartment—100 tons capacity	**HOT BIN** 4 compartment—150 tons capacity
MIXER Twin shaft jacketed type with 103 cu. ft. volume below center line of shafts	**MIXER** Twin shaft jacketed type with 103 cu. ft. volume below center line of shafts

*(May be operated with one dryer—elevator—screen section only for medium production, or with both sections for maximum production.)

America's First Builders of Asphalt Mixing Equipment

H&B ESTABLISHED 1867

HETHERINGTON & BERNER INC.

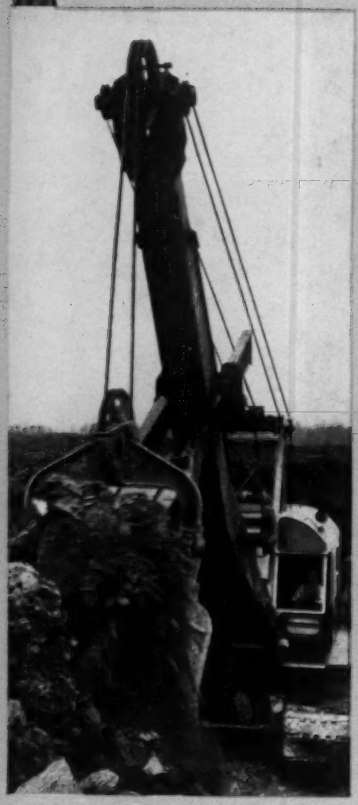
A Wholly Owned Subsidiary of American Hoist & Derrick Company

Engineers
Manufacturers

701 KENTUCKY AVE. • INDIANAPOLIS 7, IND.
Export Dept.: 205 W. Wacker Drive, Chicago, Illinois

THEY PLANNED ON "POWERSTEEL" TO HOLD DOWN COSTS

digging hardpan and boulders on highway job



"POWERSTEEL" in action for Wood & Busch near Georgetown, Ky.

Wood & Busch Co. Switches to "POWERSTEEL" on Shovel— Reports Service Doubled—Rope Still in Use!

Drilling shot holes 16 to 18 feet apart saved time, but boulders and hardpan put extra pressure on Wood & Busch's big shovel. After numerous rope breakdowns, "POWERSTEEL" was tried. "Best we've ever used," says Field Office Manager George E. Neal. Again and again Yellow Strand "POWERSTEEL" proves that, in the long run, it's the best wire rope buy on the market. Put "POWERSTEEL" to your profit test. You'll find it pays. Call your Yellow Strand distributor or representative anytime for service, for satisfaction.

Yellow Strand®
"POWERSTEEL"

BRODERICK & BASCOM ROPE CO.
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